IN THE COMPETITION APPEAL TRIBUNAL

Case No: 1284/5/7/18
1290/5/7/18

Salisbury Square House
8 Salisbury Square
London EC4Y 8AP

Monday 6 June 2022

Before:
The Honourable Mr Justice Michael Green
Derek Ridyard
Sir Iain McMillan CBE FRSE DL
(Sitting as a Tribunal in England and Wales)

BETWEEN:

Royal Mail Group Limited
BT Group PLC and Others v DAF Trucks Limited and Others **Claimants**

v

DAF Trucks Limited and Others **Defendants**

A P P E A R AN C E S

Tim Ward QC, Ben Lask and Cliodhna Kelleher (On behalf of RM/BT)
Daniel Beard QC, Daisy Mackersie and James Bourke (On behalf of DAF)

Monday, 6 June 2022

(10.30 am)

(Proceedings delayed)

(10.36 am)

Housekeeping

THE CHAIRMAN: Good morning.

Welcome back, Mr Ward.

MR WARD: Thank you, sir.

THE CHAIRMAN: I hope you are fully recovered, together with Ms Kelleher.

Just before we start, a couple of sort of housekeeping things, I suppose. We were concerned, having re-read on this issue and a couple of others, as to proportionality. The issue that we are talking about today is at best I think 12% of the overcharge, and yet we have had some 600 pages of expert report. So we think there is an issue of proportionality that needs to be borne in mind in relation to dealing with these issues. But also in relation to loss of volume, which we are meant to have a hot tub session next week, next Monday. We are happy to do that but we are just wondering whether, in the interests of time and considering that it is also a relatively small issue and perhaps most of the issues might be covered by the supply pass-on question, whether we should abandon the

hot tub session in relation to loss of volume and just have cross-examination. I imagine you can probably get that done in half a day.

MR BEARD: I will certainly consider that with those behind me because we completely understand. Indeed, I think there may have been some discussions about how we might take further matters forward in the light of the proportionality concerns that have been ventilated between the parties over the last week. So I will see where such discussions have got to and revert perhaps after the short adjournment.

THE CHAIRMAN: Yes, all right.

MR BEARD: But, yes, having reflected on these things, I think we had the same concern, that perhaps undue time was being spent on matters, that actually the gap between the parties is relatively limited.

THE CHAIRMAN: We discussed some time ago about supply pass-on and Mr Ward wanting perhaps a bit more time and we decided that those three days, the three following days this week, would be split between financing and supply pass-on. We can understand that supply pass-on is a big issue potentially, but whether we can save some time by cutting down on loss of volume.

MR BEARD: Yes, at the moment, I think so far as we are concerned we can certainly deal with the

cross-examination in relation to supply pass-on and financing issues well within the day and a half that we had allocated to us.

So unless Mr Ward has a different view, I do not think we are troubled by the three days. But I think that is actually a slightly separate question from the one that you have raised, sir.

THE CHAIRMAN: Yes.

MR BEARD: Because we are trying to identify issues where how big is the gap, how much does this matter, and I think loss of volume does jump out as one of those where actually the gap is tolerably small, I think.

THE CHAIRMAN: The amount in question is pretty small in the overall scheme of things.

MR BEARD: We are recognising these matters so we are trying to do something about it.

THE CHAIRMAN: Great. Okay. Of course tax was also, I think you were --

MR BEARD: Yes, tax I think is further under review, and those discussions have continued. I am hopeful we will be able to update the tribunal on those matters --

THE CHAIRMAN: Okay.

MR BEARD: -- but I think the tribunal knew there was a discussion between the experts about modelling and what are the remaining issues there.

THE CHAIRMAN: Yes, all right.

MR WARD: Just on the subject of supply pass-on, I was unsuccessful in my application. I recognise that, I am not about to remake it. But what I would say is that I am very much of the view now that I need the fullest time possible to deal with that.

You will appreciate that I think we have 2,000 pages of reports on that and the issues are so complicated that any cross-examination is going to have to be selective, of course, but I will be asking your indulgence to at least extend the sitting days in order to do that, working as hard as I can to manage it down as much as I can. But it is just, in truth, in my respectful submission, one could have easily spent a week on that topic. I do not think anyone would have enjoyed it or welcomed it, but it is just as complicated as that, unfortunately.

I have heard Mr Beard --

THE CHAIRMAN: I seem to remember you were rather dismissive of it all in opening.

MR WARD: Well, I have got my legal arguments, but unfortunately I was not able to get a binding ruling from the tribunal quite that quickly.

I hope when I close my case, you will be persuaded that it is all, frankly, misconceived, but I still have

2,000 pages of expert evidence to deal with, alas.

But that is obviously not a problem for today.

THE CHAIRMAN: Okay. We will certainly consider sitting longer hours, yes.

MR WARD: Thank you.

THE CHAIRMAN: All right. Well, without further ado, we will proceed with another hot tub session.

Good morning, Mr Harvey, Professor Neven. Welcome back. Right, you need to be sworn in.

PROFESSOR DAMIEN NEVEN (affirmed)

MR JAMES HARVEY (affirmed)

Questions by THE TRIBUNAL

THE CHAIRMAN: Thank you very much.

You know the score by now. I think we just proceed straight on, yes.

MR RIDYARD: Good morning, both.

So you have had our list of questions for this session, so maybe we could start, Mr Harvey, with you on the first question, which I hope will be relatively straightforward, to make sure we understand what it is we are discussing in this session.

As we understand it, there are these two effects in principle that could be applicable to this session. One is the immediate effect, if you like. So on day one, the truck is purchased, it is purchased, at least we

assume, for these purposes at an inflated price due to the infringements, and at the same time maybe a truck is disposed of, and the belief is because the new truck price is higher, as a result of that the price of used trucks, because they are substitutes to some extent, is also higher, so there is a benefit there in the disposal of that new truck on the same day, if you like, that the new truck is purchased.

The second factor being that when the new truck we just described, when that comes to be sold in the second-hand market, because there are fewer trucks around at that time because of the fact that prices were inflated and so fewer trucks were bought, the used trucks are more scarce and therefore you get a higher price for that used truck on disposal down the line.

Is that a decent description of the two factors which are at play in this session?

MR HARVEY: Yes.

THE CHAIRMAN: Professor Neven?

PROFESSOR NEVEN: Yes, I think you described it correctly.

There is a intertemporal effect which is associated with the fact that a used truck has to be used before. So there are fewer newer trucks, there are going to be fewer second-hand trucks later in the future; and then there is, indeed, an issue of substitution between new

and used truck that occurs at the time, at both points in time that you refer to.

MR RIDYARD: Okay, good.

The second question we have, maybe Professor Neven could make a start on this one: in both of your reports you talk about this chain of substitution between new trucks and used trucks. But I would like to understand in more concrete terms what you understand by this notion of chain of substitution and what evidence is there that new trucks and old trucks are substitutes for one another.

PROFESSOR NEVEN: Yes. Let me just say a few things about the conceptual framework.

I think that it is important to keep in mind that trucks are durables. I mean, trucks are essentially a stock of services. Trucks can actually transport goods over a certain amount of time, so that there is a presumption there is a substitution between a new truck and an old truck to the extent that they both can provide transportation services; that is to say a new truck can provide transportation services over a longer period of time than used trucks.

I mean, if you have a truck that on average has a ten-year life and new trucks have ten years' worth of transportation services, a truck that is five years old

has five years' worth of transportation services that are left. So that there is inherently a substitution because these goods are durable.

However, new trucks and old trucks are not substitute or are differentiated in terms of quality, because, clearly, if you have a new truck and if you are anticipating, you are considering the transportation service that these new trucks can deliver, say, over the next year, I mean, clearly the new trucks will be of a higher quality because it is more reliable, because it has, you know, a newer finish, because it is less likely to break down, because possibly it may have sort of better condition.

Now, so that a new truck is a higher quality version, if you want, of a good that can provide transportation services over a period of one year relative to, say, a five-year truck, if you are considering the transportation services that a five-year truck can deliver over the forthcoming year, it is going to be a lower quality, because, I mean, it is used to some extent, it is worn, it may have a higher probability of breakdown. It may have also a higher maintenance cost, for instance, associated with its age.

But the fundamental intuition is that new trucks and used trucks are substitutes because they are both

providing transportation service. I mean, a used truck is only a new truck that has fewer transportation services to deliver left. That is to say the stock of transportation services that it can still deliver is lower.

Now, so given that the economic literature emphasises the fact that durables of that kind may have a differentiation in quality according to age, the transportation services provided by an older truck are of a lower quality than those provided by the newer truck, the conceptual framework that is used in order to look at substitution between products of different quality is indeed one in which there is a structured substitution. That is to say that in all of those frameworks, the highest quality product will be a substitute for the one that is just below in terms of quality. So you have the highest quality, the highest but one quality, and then you have the highest but two quality and the highest but three quality and so forth, and so the economic frameworks that are commonly used to think about the substitution between products that differ in quality has that structure, so that, indeed, I mean, the substitution or the substitute for the highest quality truck would be the highest but one quality level and so forth. That is the idea of the

chain of substitution. The idea is that the substitution among goods of different qualities will be driven by these differences in qualities.

The closest substitute for a good of any quality level will be the one that is just above in terms of quality and just below in terms of quality, and that is what this framework essentially entails, and it is a very common framework in the way in which the demand for goods of different qualities are formulated, are conceptualised.

Now, there is then a question of, you know, what sort of evidence do we have that at the end of the day there will be a substitution between new trucks and the trucks of the type that Royal Mail and BT are selling. Because, as emphasised in the reports, BT is selling trucks that are typically, you know, five/six years old -- sorry, Royal Mail is selling trucks that are typically five/six years old and BT is selling trucks that tend to be even older, up to ten years old.

So the question is to what extent is the new price still affecting the price of trucks like those sold by Royal Mail that could be sort of five or six years old along that chain of substitution?

I think that the proof of the pudding is in the eating. I mean, if I can estimate empirically, an

empirical relationship between the price of new trucks and the price of the second-hand trucks that are sold by Royal Mail, this will indeed provide evidence that there is a residual substitution between these products.

MR RIDYARD: Mr Harvey.

MR HARVEY: On the framework point and how I think about it, it might be helpful to think of three groups of trucks: the new ones, nearly new, old, and one way of thinking about the chain of substitution is to imagine the price of the new trucks rises. Well, what happens next? It may be that a new truck buyer is not very interested in the old truck, but the new truck buyer substitutes to the nearly new trucks and that puts upward pressure on the price of nearly new trucks. Then the nearly new truck buyers, as was, then substitute to the old trucks, putting upward pressure on the demand for old trucks.

Now, obviously I have made that in a very stylised way and of course here we have got really quite a long chain because the trucks in question are very old. What matters in terms of whether that logic works, obviously, is the ability and willingness of new truck buyers in the first instance to substitute to nearly new trucks and so on and so forth. As that chain, as it were, gets longer, you have fewer and fewer people switching to the

old trucks and so the price effect that I have described would get weaker and weaker. It is an empirical question.

In terms of the evidence, here I think we are somewhat hampered again really because we are considering a market phenomenon with data only from Royal Mail and BT. Things that we do know in terms of the extent of substitution: I suppose we do know, at least for Royal Mail and BT, they were not considering nearly new trucks when they purchased the new trucks. They invited bids from new truck suppliers. The second thing that we know, I think, is that -- again, going to some of the points that Professor Neven made -- when people are buying new trucks, why buy a new truck when you can go and buy a cheaper one? One of the reasons will be you want a longer life for the truck. Another reason we have heard is that people want their truck -- they want a bespoke product, I think we have heard, that is tailored to their needs. So I suppose it gives them the opportunity to buy that truck.

So those are the things that we know, I suppose, at one end of the chain.

Where it gets murkier is the middle bit of the chain that I described, and this spectrum of old trucks. I think --

MR RIDYARD: Sorry to interrupt. Just on the fact, is there any evidence that BT or Royal Mail sort of went out and bought three-year-old trucks?

MR HARVEY: I do not think there is. I think they typically purchased --

MR RIDYARD: It is either new or --

MR HARVEY: Invited the manufacturers to bid, yes.

SIR IAIN MCMILLAN: Could I come in, please? I understand the issue of substitution, I understand the issue of quality and so on. Where does the issue of affordability come into these equations? Because something can be great value for money but if the customer cannot quite afford to pay the market price for a product, then that may delay the purchase or, you know, set it back for some time.

Could you both comment on that? Is that an issue that could affect the price of the used trucks further down the chain, as they get murkier, in your words?

MR HARVEY: Well, so I suppose the affordability is relevant in two ways. In the first instance, that might be one of the reasons why you would consider substituting from a new truck to a nearly new truck, I suppose; just cheaper. But it also matters at the other end.

So, you know, we observe that the price of the used trucks of the type sold by the claimants, I think it is

of the order of £2,000, I think, for maybe the base trail(?), £2,000 to £3,000, they are quite cheap trucks. So we can ask the question as to why would you buy that truck? It may well be that you are buying it, notwithstanding the limitations of buying a very old truck, because you are very price-sensitive; you care a lot about price over the other characteristics. Other things equal, that would tend to reduce the effect of a change in the supply of the used trucks on prices because if customers are very price-sensitive, that will obviously stunt the demand and the suppliers will not enjoy a higher price uplift.

I think it affects sort of considerations at both ends of the chain.

PROFESSOR NEVEN: I do not disagree with what Mr Harvey is saying. Just to emphasise the fact that, you know, affordability, you can think about it again in terms of willingness to pay for quality. I mean, it is the same thing. There are some buyers of transportation services that want to have a truck, I mean, that would like to have a high quality truck, and I think most people would prefer to have a high quality truck. But some people simply cannot afford to have a high quality truck, so they actually go into the market and buy used trucks because they cannot afford a high quality one. Indeed,

if you look at the structure of those economic frameworks, I mean, that is essentially what they capture: this idea that everyone would like to have a new truck, everyone would like to have a new car, but some people simply cannot afford it and will, because they attach less significance to quality and because they are constrained, they will go into the used truck market.

Now, let me just take -- I think the fact that there was a substitution between sort of new durables and old durables is I think also a common observation. I know that one should be careful with drawing inferences from other markets, but I think it is useful to refer to what we see at the moment.

What we see at the moment is that the price of second-hand cars has gone up by 30% and second-hand cars, not that are nearly new, but second-hand cars that are sort of three to five years' old. I mean, that is everywhere in the press. I am sure you have seen it. The price of a three to five-years-old Ford Fiesta has gone up 30% in the last few years simply because there are no new cars available, because as you know there are some supply constraints with respect to new cars.

Again, we are talking about trucks, we are not talking about cars, but the underlying principle that

a car as well as a truck is a stock of transportation services and that you can substitute those with variants of different quality I think is a very sound intuition.

MR RIDYARD: Just one observation on the factual evidence.

I think it is true that both Royal Mail and BT at some stage, probably after the global financial crisis, decided to extend the lives of their trucks, let us say, from six to seven years, or six to seven to eight years, or whatever the number was. Doing that, is that a tangible example of substitution between new and old trucks? Because in doing that, in deciding to say "I am going to keep hold of my trucks for seven years instead of six years", am I not choosing, in Professor Neven's terms of the trucks providing a stream of services, I am choosing to have a six-year-old truck service for a year instead of -- the alternative would have been to buy a new truck, so in that year I would have bought a brand new truck service in that year. So is that a tangible example of the substitution working from one end of the chain to the other?

MR HARVEY: I think two immediate reactions. I think the first is it sort of depends why that decision was made and was it as a response to -- a sort of price response, whether it was a more sort of "Right, we think we can run these trucks for longer", almost irrespective of

their prices, and I am not sure that in the witness evidence it is indicated that that decision was made as a response to a price change.

MR RIDYARD: Right. They did not say "Our mechanics have suddenly got better at fixing our trucks", they said "We are running out of money so we are going to do this for that reason". So it was not necessarily a price impetus, but it was a commercial impetus that seems to have driven them.

MR HARVEY: Yes. So I think -- I suppose the second observation in relation to that is, when they are making those choices, I suppose the situation they are facing is slightly different to the situation of AN Other new buyer. So the situation they are facing is that they have good visibility of the history of the truck, how it has been treated, the servicing and so on, so I suppose it is slightly different to the situation where the would-be new buyer is actually substituting and buying a nearly new truck that is sold by someone else, which is the circumstance we have here.

So I think -- I am certainly not saying it is irrelevant. Clearly, for those customers, they are thinking about whether they can extend the truck life a little bit longer. But their circumstances are different to a buyer going into the market and buying

a truck from someone else, I think.

THE CHAIRMAN: Did you want to add anything?

PROFESSOR NEVEN: No, I think the intuition is sound in the sense that the choice Royal Mail was facing is either buy transportation services from a new truck, say for the next five years, or buy transportation services from an old truck which would be extended from five to six years and then, of course, for the same horizon have the service of a new truck, purchasing a new truck at the end of the extended life.

So that suggested indeed that there was a substitution, that the choice of having truck services from a new truck for five years relative to have one year of an old truck transportation service and then another four of a new one are substitutes.

THE CHAIRMAN: Going back to Mr Harvey's categorisation of three different types of trucks -- new, nearly new and old -- we are not talking about nearly new trucks in this case, are we? Because I do not think Royal Mail or BT were selling nearly new trucks, which are the closest substitutes for a new truck. They were selling trucks after five, six, seven, eight years, which would be old trucks.

MR HARVEY: Yes.

THE CHAIRMAN: So if you are looking at the situation when

they are buying new trucks at the same time they are selling old trucks, can you really say that that is a relevant sort of substitution or that that would affect the price of an old truck?

MR HARVEY: I think, you know, my three groups are obviously highly stylised, so I think a point that I have made in my report is this chain that we have just described, substitution from one group to another group to another group, I think is arguably quite long. It is not just that the trucks are old, it is that they are relatedly in relatively poor condition or at least a proportion of them are.

So it raises the question as to whether there is a break, as it were, in this chain where insufficient customers would find themselves sort of down trading to mean that the price change for the new truck would filter its way down to the prices of used trucks. So the fact that you have got these two groups does not of itself undermine the chain of substitution argument in theory; it is just that in practice you need to believe there is a lot of this substitution going on to have the material price effect at the end that Royal Mail are selling at.

MR RIDYARD: Okay. So maybe we can move on to demand elasticity. Maybe I should preface this, particularly

to Professor Neven. I understand that your analysis sort of bypasses this and you go straight -- you say if there is an effect we will see it in the prices and therefore the answers will show themselves. But we are asking these questions because we want to do as much as we can to get a sort of sense-check, an independent sense-check, if you like, of the answers that are coming out of the purely price analysis.

So on demand elasticity, which is obviously a key factor in driving the effects that we are talking about here, we just wondered whether the work you had done on overcharge, you know, reveals any information indirectly about what the price elasticity of demand is for new trucks.

Mr Harvey, first of all.

MR HARVEY: I do not have a number from the overcharge work. I suppose what we do have is some of the qualitative information that we spoke about before. So the things that effect the elasticity demand for the product, they would tend to be lower when the product is a necessity, that you need it for running a business, and when there are fewer substitutes for the product. We know these things for Royal Mail and BT to a degree, we do not know them for the rest of the market.

For Royal Mail, obviously they need to transport the

mail from A to B, and for a lot of the work the trucks do, they are taking it from out of town into town centres to delivery offices. So, intuitively, the substitutes for new trucks to them would be quite limited.

Then for BT, as I understand it, there are not substitutes for trucks for putting up poles and that type of thing. So the combination of necessity and low substitutability sort of points intuitively to a (overspeaking) --

MR RIDYARD: Professor Neven, is that your observation too?

PROFESSOR NEVEN: The question here is whether the work on overcharge is giving us an indication.

MR RIDYARD: Yes.

PROFESSOR NEVEN: The overcharge question is a reduced form of question. It is not a question in which we are directly estimating the demand elasticity. I have been sort of trying to see how we could possibly, making assumptions, deduce something about the price elasticity, and I do not think you can do that --

MR RIDYARD: Okay, fine.

Then if we move on to the Ivaldi and Verboven study that you both talk about in your reports.

Professor Neven, what reliance can be placed on that and is that a useful sense-check on elasticity of demand for

the trucks that we are talking about here?

PROFESSOR NEVEN: As you pointed out earlier, I am not relying on any of this.

MR RIDYARD: Understood.

PROFESSOR NEVEN: We did the analysis of Mr Harvey.

To be frank, the analysis of Ivaldi and Verboven is one that relies on a lot of assumptions. If you look at the estimation they actually do a logic estimation, actually it is -- and it is a logic estimation which relies on list prices, not on actual transaction prices, which, as we know, is a concern in this market.

They end up with estimates -- well, the other thing is that, you know, it is a nested logic model, they are imposing quite a bit of structure in terms of the degree of substitution between trucks of different manufacturers. They end up with estimates which are plausible. They are also plausible to the extent that they are consistent with what the truck manufacturers have indicated what these elasticities were according to internal estimates to the Commission, because this work was undertaken in the context of the attempted merger between Volvo and Scania. This is the context in which they undertook that work.

So in order to have a sense-check on the elasticity estimates that they obtained, they also checked with the

Commission whether the Commission could get some estimates from the manufacturers directly and, as we have both quoted, I mean, the Commission has ended up with estimates of the elasticity around 0.6, which is slightly lower than, you know, what Ivaldi and Verboven estimate, knowing that, you know, in the type of implementation that Ivaldi and Verboven are doing, the significance of the market for the outside good, that is to say what do you do if you do not buy a truck, that is essentially what is significant in those models. The assumption that you make about that is also quite significant, quite important for actually identifying the elasticity.

So, in short, it is what it is. The Commission relied on it. If you look under the bonnet, I am not sure this is necessarily the most reliable estimate, but it ends up with an estimate that is consistent with what the manufacturers at the time seem to indicate.

MR RIDYARD: Mr Harvey, anything on that?

MR HARVEY: In terms of reliance, I did incorporate those estimates into some of my sensitivity analyses alongside others. They have the benefit of looking at the UK trucks market, roughly around the period in question. They do have the limitations that Professor Neven has identified.

One thing that I was concerned about in terms of the level of them was whether they would tend to be too high on the basis that they are considering the supply of trucks above 16 tonnes and a segment for those, and what we are concerned with is the supply of all trucks above 7.5, and so --

MR RIDYARD: So some of the substitution they might be capturing is between big trucks and small trucks where --

MR HARVEY: Big trucks and small trucks, yes.

Briefly, within their modelling framework, I think the way that would be caught is via the size of the outside good. So, you know, if a high proportion of the outside good, which is the things that people substitute to when they do not buy trucks, include smaller trucks, then I think that is how it manifests itself in those estimates. But there is no way of sort of sizing that, really.

The range of estimates that they quote -- so they have their own, which is between 0.6 and I think 1.3. The 1.3 estimate of the elasticity is for the very sort of large outside good, so it sort of says that the market is four times the size, I think -- is that right? -- of the -- sorry, three times the size, quite right, of the actual number of 16-tonne trucks sold,

which intuitively feels like quite a large number compared to the Commission's figures that they quote, although we do not know how those were calculated. That number seems a touch high as well. The Commission quotes a figure of 0.4 and 0.9.

Taken together the numbers seem to suggest that the elasticity demand for new trucks is inelastic, which seems intuitive to me, but there is quite a wide range of estimates.

MR RIDYARD: Do you think that trying to understand demand elasticity is a useful check on the results, for example, that Professor Neven is getting on his pricing analysis?

MR HARVEY: I think so. I think so, because if the elasticity of demand for new trucks is low, it has two implications. The first is that the rate of substitution from new trucks to used trucks suggests that new trucks do not have many strong substitutes. So it perhaps calls into question the strength of substitution between new and used trucks on the first theory. On the second theory it also implies that the reduction in the supply of new trucks would be limited.

If we were thinking about this in terms of a sort of market definition-type process, I think with that evidence you would reach the conclusion that there is

a narrow market for the supply of new trucks, which you would tend to think would weaken the price effects. Where it is harder to push it further than that is it does not of itself take you to is an estimate of a one-for-one relationship too high or too low, I think, directly.

THE CHAIRMAN: Professor Neven.

PROFESSOR NEVEN: Yes, I think that this particular question that you raised actually kept me busy for part of the weekend, because I thought it was an essay question that you were putting to me. Is it that the estimates that we are getting can be interpreted in order to shed some light on the elasticity so that we can also cross-check it with the estimates of Ivaldi and Verboven?

If you look at the interpretation of our estimate, as we are likely to discuss later, there are two coefficients that have a quasi structural interpretation. There is one coefficient; that is the ratio between the elasticity of demand for new trucks over the elasticity of demand for used trucks; and there is another coefficient that has a quasi structural interpretation, which is the ratio between the elasticity of demand for old trucks over the cost price elasticity of the demand for used trucks with respect to the price of new trucks, which is alpha 2.

So the question is, using these two coefficients, can you cross-check the value of the elasticity of demand for new trucks, which I thought was really the sense of your question. I came to the conclusion that you cannot. I came to the conclusion that, you know, all what you can get from these estimates are estimates about relative values of the elasticities but you really cannot, I mean, get information about the absolute value.

The only comment I would make, however, in relation to that is that, as we are going to discuss later, we can estimate these parameters, so we can estimate these ratios of elasticities, both the elasticity of demand for new trucks and old trucks and elasticity of demand relative to the cost price. In particular with respect to the first one, if the elasticities were very small, we would not be in a position to estimate the ratio, because estimating the ratio of two very small numbers, given the noise that you have in the data, would lead to standard errors such that we would not be in a position to estimate them.

So I think the fact that we can estimate these parameters tends to indicate that they are of a significant order of magnitude. They are not 0.01. I mean, they are probably of a higher order of

magnitude. That is the only thing I can say.

MR RIDYARD: Okay, thanks.

Lastly, before we get on to the detail of Professor Neven's results, it just occurred to us that if there was an increase in the price of used trucks, it could in principle generate a supply response. You know, it is worthwhile resurrecting trucks that you otherwise would have scrapped.

I just wonder whether there is any empirical evidence or any factual evidence on that that you have come across or think would be useful as a way of -- because I guess that would -- well, clearly that would dilute the price effect we are talking about.

Professor Neven, did you come across anything on that, or consider that issue?

PROFESSOR NEVEN: Yes, I think that you are right that, in principle, an increase in the price of new trucks can lead to an increase in the price of used trucks because of substitution that we have discussed, which in turn, because the price is going up, it might lead users of used trucks to keep their trucks longer, for an additional year or so. That actually is consistent with the example that you gave earlier with respect to Royal Mail that decided to extend the life of its trucks by one year when the conditions, in terms of financings,

were difficult.

So, indeed, this is an effect that is possible, which also means that the interpretation of my estimate, again, are reduced form estimates. I mean, because -- so I am looking at the extent to which a change in the price of new trucks affects the price of used trucks and of course the net price effect, or the price effect, would be the result of both the demand effect, substitution effect, as well as a supply effect.

MR RIDYARD: I understand that, which is why I asked whether there was any -- did you look at whether that had happened or was there any tangible way of getting to see whether that had taken place?

PROFESSOR NEVEN: I did not, because it does not matter for my estimates.

MR RIDYARD: Okay.

Mr Harvey?

MR HARVEY: I did not uncover evidence in support of that.

MR RIDYARD: Let us then move on to Professor Neven's econometric exercise, as has been referred to already a few times.

Professor Neven, if you could just take us through the key results. We do not want a full exposition of everything, but just to give the tribunal the kind of three-minute version, if you like, of what your results

are and what is driving your results that you have achieved.

PROFESSOR NEVEN: Okay. So the approach that I am using is actually quite simple. It is quite straightforward in the sense that we want to find out to what extent higher prices that were paid for new trucks as a consequence of the infringement may be reflected in the price at which BT has sold the trucks in the second-hand market.

So in order to estimate this pass-on, we need four prices. We need the price for the new trucks that BT has paid; we need the price for the new trucks that BT would have paid in the absence of the infringement; we need the price at which BT and Royal Mail -- sorry, both of them -- BT and Royal Mail have sold the truck when they sold them in the second-hand market; and we need to find out what would have been the price at which they would have resold the truck in the second-hand market in the absence of the infringement.

So we observe two prices. I mean, from the data, we know the price that they paid for the new trucks, we know the price that they paid -- sorry, that they received at which they sold the second-hand truck. The third price, which is the price at which they would have paid the truck, the price that they would have paid in the absence of the infringement, we can assume it by

assuming that it was an overcharge of X%, and whether it is 1% of 10% actually it does not matter for the model but, you know, we just make an assumption.

So we assume in the context of our estimates that in the absence of the infringement the prices would have been 1% lower for new trucks, but this assumption is unimportant.

Then we need to compute the fourth price. The price is the price at which Royal Mail and BT would have resold the truck in the second-hand market in the absence of the infringement. How do we get that? We get that by estimating econometrically a relationship between the price at which Royal Mail and BT sold the trucks in the second-hand market in relation to the price of those trucks when they were new, and the price of trucks at the time at which they resold the trucks. So that we can -- by estimating this relationship, we can say, okay, econometrically in the data we observe that an increase in the price of new trucks by X% is reflected in the price of second-hand trucks by Y%.

So we can establish empirically a relationship between the price that Royal Mail and BT, in particular Royal Mail, obtained for its used truck in the used truck market in relation to the prices of those trucks when they were new, also controlling for the price of

new trucks at the time at which they resell.

So we use that relationship, that relationship that we estimate from the data, in order to compute what would have been the price at which they would have resold the truck in the absence of the infringement. How do we do that? I mean, since we have this relationship between the price at which they resold the trucks in the second-hand market in relation to the price of those trucks when they purchased new, we just change the price of new trucks when they were initially purchased by the amount of infringement. We say, okay, I reduce that price by 1% and, using my estimate, I can obtain an estimate of the extent to which the price that they would have obtained in the used truck market would also be reduced.

So essentially this approach is very straightforward. I mean, I have two prices observed in the data. The third one I obtain by making an assumption about the effect of the infringement, but this is an assumption that is unimportant for the estimation. Then the fourth price I obtain from this econometric estimation of the relationship between second-hand truck prices and prices of trucks when they purchase new.

THE CHAIRMAN: These are the same trucks?

PROFESSOR NEVEN: Yes, exactly. So I have a data set for Royal Mail and for BT, but it is really the data set from Royal Mail which is rich enough to be used, in which I know the trucks and I can sort of follow them through their life. So I know the price at which they were initially purchased and I know the price at which they were resold in the second-hand market.

I also can control for the characteristics of the second-hand trucks. I know, of course, not only how old they are when they are resold because I know the date of initial purchase and I know the date of the resale, but I also know the mileage, I know the condition of the truck, because there is a variable in the database of Royal Mail that describes the condition of the truck, so I can control for these characteristics. Indeed, I am estimating that relationship from Royal Mail's data on the same trucks. I know the price at which they were initially purchased, I know the price at which they were resold.

MR RIDYARD: Mr Harvey, we are obviously going to come on to some aspects of this analysis, but any comments on that overview?

MR HARVEY: The way I think about the analysis is that Professor Neven has estimated a relationship between the used truck price and the new truck price, and using that

estimated relationship, so a 1% increase in the new truck price, he can work out to what extent the used truck price rise and that is the core of the model. We will talk about some of the assumptions and so forth that go into that, but that I think -- happy with that description.

MR RIDYARD: One issue we do not have questions on which was raised by Professor Neven's response was it does not matter whether you talk about a 1% price rise or a 10% price rise. Do you agree with that?

MR HARVEY: Broadly. Broadly speaking, in terms of the mathematics of the calculation, yes. I suppose in principle the scale of the price change could affect the extent to which the used truck prices respond. It may not be proportionate, as it were, but in terms of the way that the calculations work, I am comfortable with that.

THE CHAIRMAN: You are assuming a 1% overcharge, but if there was a 10% overcharge, does that not have an impact on things like demand and --

PROFESSOR NEVEN: Yes, I mean, clearly, but all of that is controlled in the model in the sense that, I mean, the model, as I estimated, is linear in percentages. So that what happens is that, if the price of a new truck is increasing by 10% because of the overcharge, I mean,

the effect on old truck prices, on used truck prices, will be proportionate -- is proportionate.

Now, that is the way --

THE CHAIRMAN: Are you not just assuming then the conclusion?

PROFESSOR NEVEN: No, because what happens is that I am estimating a relationship between used truck prices and new truck prices that does not have to be driven by the infringement. It could be driven by anything else, okay? Indeed, I have a very large fluctuation in used truck prices in my data, so it is not as if my estimation relies on that assumption. My estimation is completely agnostic about the reasons for the changes in new truck prices.

It is only at the stage in which I am computing the pass-on that I have to make an assumption about the effect of the infringement. But my estimate is completely agnostic. My estimate is just saying, "I am looking empirically at a relationship between second-hand truck prices and the price at which they were initially purchased, whatever the reason for the changes in the new truck prices". Of course, the level of new truck prices in my data for trucks of different characteristics does change quite a bit, okay?

MR RIDYARD: So it is scalable really?

PROFESSOR NEVEN: It is scalable because it is agnostic. I mean, there is nothing in my econometric estimation that relies on this 1% assumption. My econometric estimations just say I have prices of second-hand trucks, I know at what prices initially they were purchased, I estimate that relationship, whatever the reason for the change in new truck prices.

MR RIDYARD: Okay.

Moving on to one aspect -- and Mr Harvey, maybe I can put this to you -- one aspect which I think you both acknowledge is not ideal but it is what you had to work with, is the fact that this analysis just relies on DAF sales, so one supplier sales to one customer, DAF sales to Royal Mail, as opposed to ideally, you know, one would want to do it across the entire market for new trucks and used trucks across all customers. So what limitations arise, in your view, Mr Harvey, because the analysis has to rely on one supplier and one customer?

MR HARVEY: I think the three main ones are the read-across to BT that needs to be made, which we will come to talk to later. That is related. The second one is because we only observe that the used trucks are the types sold by the claimants, we only have a few of the older trucks, and so it is not possible to empirically examine whether this chain that we have discussed exists because

we have no observations of trucks that are nearly new or not quite so nearly new. So we cannot examine that directly with the data.

Then the third issue is that, in principle, the prices of the other truck manufacturers could also have a bearing on the demand and supply of the used trucks which we do not observe either. Obviously, there is nothing that can be done about that. So, for me, they are the three main limitations that arise from the data.

MR RIDYARD: Professor Neven, do you agree with that?

PROFESSOR NEVEN: Of course I agree with the fact that the only data, reliable data that we have is for Royal Mail and it means that the estimation that we are performing, the relationship that we are identifying between second-hand truck prices and new truck prices is a relationship that is valid for Royal Mail, because we are only using Royal Mail data and, you know, I do not know what would happen -- I mean, I would not be confident, to put it in those terms, to extrapolate that relationship for trucks that would be very, very different; for instance, for trucks that would be much newer than the trucks that are resold by Royal Mail.

So that is a limitation of the data, sort of in technical terms. What we are doing is a local estimation. We are doing an estimation by using new

truck prices and second-hand truck prices that are mostly for trucks that are five to six years old. So we should not try to extrapolate, to say too much about what these relationships would be for trucks that would be resold at different points in time.

Having said this, it is not quite right to say that we only have trucks that are resold after five/six years. We also have a few, not many but we also have trucks that are resold after two to three years. So it is not completely five/six, but still, I mean, the majority of trucks are resold after five/six years.

So my reaction would be to say I would be concerned about extrapolating these results, for instance, to other buyers and other buyers that would have resold the trucks earlier than Royal Mail has been.

MR RIDYARD: We do not have to worry about that here.

PROFESSOR NEVEN: I do not have to worry about that here.

MR RIDYARD: What about the absence of data from other truck suppliers and other --

PROFESSOR NEVEN: In principle, you would expect the closest substitute to a DAF used truck to be a DAF new truck. So in a sense, I mean, by looking at a relationship between second-hand truck prices, okay, for DAF Trucks --

MR RIDYARD: Sorry, why do you expect that?

PROFESSOR NEVEN: I expect that because I would expect the characteristics, I mean, to be more closely aligned. I mean, if you are looking at a second-hand DAF truck and see to what extent the price of a second-hand DAF truck sold by Royal Mail is affected by the prices of new trucks at the time of resale, I mean, I would expect the relationship to be strongest for the products that are closest substitute.

MR RIDYARD: Yes, of course, but why would that be a DAF truck?

PROFESSOR NEVEN: Because DAF Trucks had the idiosyncrasies. You know, what is the closest substitute in terms of characteristics of a used DAF truck? Well, it is a new DAF truck with the same characteristics in terms of power, in terms of cabin, in terms of the characteristics that define the truck.

MR RIDYARD: Even if it is two or three times the price, whereas you could get a second-hand Mercedes truck for a similar price? I can understand you might have a preference for DAF over Mercedes or Mercedes over DAF.

PROFESSOR NEVEN: Yes, but be careful about the difference in prices. I mean, the difference in prices, they reflect age because of the stock of services that have been depleted.

MR RIDYARD: Yes, understood.

PROFESSOR NEVEN: But in any event, as indicated by Mr Harvey, I think it is reasonable to concentrate on DAF trucks as being the closest substitute, as being the trucks whose prices would most affect the prices of second-hand truck prices -- of second-hand DAF truck prices, but I do not have prices for the manufacturers, the competing manufacturers in any event so there is not much I can do about this.

MR RIDYARD: I understand you could not fix the problem but, I mean, it is a question of understanding how big a problem it is in terms of how much reliance one places on your results. That is really the question I am asking.

PROFESSOR NEVEN: Okay. I think that there is an answer to that question in some of the sensitivity that I am performing with respect to the auxiliary regression.

Okay, here we are getting a bit technical, but just to explain what I am doing to estimate that relationship between used truck prices and new truck prices. I do not actually use in my regression exactly the price of the truck sold in the second-hand market when it was purchased new; but I use an index, and it is an index of products that are comparable to that particular truck. Just to be precise.

So let us assume that DAF -- sorry, that Royal Mail

bought a DAF truck in 2004, resold it in 2010. I know the characteristics of that truck, I am going to use the second-hand price in my regression. I am also going to use the price at which that truck was purchased new, but instead of using the price of that particular truck, I use an average price which is the average price of trucks that were similar to that truck.

Why do I do that? Because I do not want the idiosyncrasies of the negotiation that took place in 2004 to affect the data. It is also very intuitive. I mean, if you were a very good bargainer, in buying the truck, you would have a low price initially. But when you resell it in the second-hand market, the fact that you had a very good bargain initially would not matter anymore because the substitutes at that point are other trucks that are similar.

So it is important indeed to avoid that the idiosyncrasies of the initial negotiation affect my estimate, not to use the actual prices that were paid for the trucks for the initial purchase, but to look at an index of similar trucks. Okay? This index of similar trucks I obtain through what is referred to as an auxiliary regression. So I basically predict the prices of trucks that are similar to the trucks that were initially purchased and then resold in the

second-hand market.

By changing the characteristics of that auxiliary regression, I can see to what extent including or excluding closest substitutes will affect my estimate. What I find is that my estimates are largely robust to the type of substitute trucks that I introduced in the construction of that index, except for extremes. We may discuss that later, but as long as I include reasonably different alternatives in terms of substitution in the construction of that index, my estimates are robust.

So that suggests that if I were to introduce -- there is an amount of speculation in the last part, all what I observe is that the construction of my index is robust to changing the scope of the substitute. So that leads me to speculate that if I were to introduce other substitutes that would be trucks of other manufacturers, it would be equally robust.

But it is just because I observe that this -- you know, the change in the scope of substitute that I used for this price index does not matter all that much within reasonable bounds.

THE CHAIRMAN: So the index is compiled from UK market data --

PROFESSOR NEVEN: All --

THE CHAIRMAN: All DAF trucks -- customers.

PROFESSOR NEVEN: Exactly. DAF, exactly.

So basically this index I build by using, you know, the database that I have that we discussed last week, that I used for the overcharge in which I can predict average prices as a function of characteristics.

So I can predict what is the average price of, say, an LF truck 55 with 210 horsepower and a particular cab and a particular configuration, and that is the index that I used.

It is important to do that, not to be misled actually by the fact that possibly Royal Mail has obtained very good prices initially.

You know, and of course the fact that Royal Mail has obtained very good prices initially gives it -- with the opportunity to monetise that, because when it is reselling the truck, it is reselling the truck in competition with customers that were not as good as Royal Mail in obtaining low prices initially.

MR RIDYARD: Mr Harvey, any comments on that?

MR HARVEY: I suppose just a clarification.

I was not trying to suggest that DAF new trucks would necessarily be the closest substitute for the used trucks sold by the Royal Mail. It does seem to me that probably it would be other old, cheap trucks. But I do not have -- we do not have evidence on substitution.

I think the second comment, just on the conversation we have just had, obviously we are going to talk about that in some detail in a moment, but I do not think any of those sensitivities really go to the question that you were asking around the availability of non-DAF manufacturer truck price information. It does raise a lot of questions about which new trucks we say are substitutes and which used trucks substitutes for new trucks in terms of the characteristics and information we have available to do that.

I think it is a slightly different issue.

MR RIDYARD: We have a few minutes. Let us take the next question.

I know, Professor Neven, one of the criticisms that Mr Harvey raises is the fact that you are just relying on the new truck price and then the eventual sale six years down the line with no observations on the prices in between, as it were.

Can you comment on what challenges that raised for your analysis?

PROFESSOR NEVEN: Okay, in terms of principles, let us think about the economics of what is happening here, is that, you know, when you increase the price of new trucks, fewer new trucks are being sold, which means that in the future you are going to have fewer second-hand trucks,

because second-hand trucks --

MR RIDYARD: Other things equal, yes.

PROFESSOR NEVEN: Now, of course, I mean, I am only using the price and the demand condition at the time of the initial purchase. Of course what is happening in between the time of the initial purchase and the time of resale, I mean, we also have demand shocks, and these demand shocks might also affect the supply of trucks at the time at which the truck is actually resold.

Now, so in terms of principle, yes, this could have an effect. Now, empirically, how do you deal with it? I mean, the thing is that you cannot introduce all of these intermediate prices because they are all highly correlated. So if you do that, you are not going to be in a position to identify the effect of every single one of them. It is just impossible because they are all highly correlated.

So what I do, which I think is a reasonable approach to address that concern, is that instead of taking only the price at the initial purchase, I take the average of the price for one, six and twelve quarters, before and after. So I basically smooth out. I basically -- instead of saying, okay, I am only using that price, I take into account the fact that, you know, other shocks may also have an impact that occur after the time

of the initial purchase, and I can incorporate that into the construction of this average.

If I do that -- I did it for one and six, I now have done it for twelve, and the results are robust to that. So I think that, yes, I recognise the fact that theoretically this is true, I mean that all these intermediate prices may have shocks in demand that will affect the second-hand truck prices, but in order to control for them I used this average, not the average new truck price at the time of the original purchase, but the average over several quarters. In a sense it is the average of the average, right, because it is the average of trucks with the same characteristics at the time of the initial purchase averaged over a number of quarters before and after.

MR RIDYARD: Mr Harvey, does that respond to your concerns, and if not, why not?

MR HARVEY: So I think there are two issues to consider. One is -- essentially, I think the argument is that the omission of those intermediate periods, what is going to happen to the variables that are left in the regression, and the idea is a thing that they will sort of pick up some of those effects.

Now, assuming that the overall effect is right on average, I think there is still a question about how

that sort of breaks down as between the supply effect, the contraction of supply leading to upward pressure on prices, or potential for that, and the demand effect, the substitution between new and used trucks.

Now, if the demand effect is estimated too low as a consequence of this, then when we apply those figures to the period after the infringement, where we are not seeking to take account of that demand effect because it is not there after the infringement, that will bias the results. So that is the first issue.

The second issue -- which I think Professor Neven has alluded to -- is that what the data is going to be picking up here is, if you like, the average duration between purchase and sale across the sample as a whole. If there is this supply effect, you would expect it to be greater for trucks where there is a larger gap between purchase and sale, other things equal, because there is longer for the supply effect to accumulate, I suppose.

Equally, it would be the other way around. So for trucks that were sold closer in time to one another, the (inaudible) would go the other way.

So the question here is whether that all comes out in the wash, if you like. You go a bit too high on one, bit too low on the other and it all works out. I think

the slight challenge with that is for the trucks that are sold closer in time, ie closer in time to when they were purchased, they will be sold at a higher price on average. So I do not think it will necessarily come out in the wash. It will tend to overstate the pass-on effect through this assumption that cannot be controlled for.

So they are the two issues. So I do recognise the sensitivities and I understand they have been done for pragmatic reasons, to see what happens, and they perhaps go some way to address my first issue. I am not sure they are capable of going very far to address the second because it is inherent in the data.

THE CHAIRMAN: You look as though you did not agree with that.

PROFESSOR NEVEN: Yes. I did not understand the second. Can you try again?

MR HARVEY: Yes. So the second one is you have got an average -- what this will pick up is the average duration between purchase and sale and so, if you like, the average effect of a contraction in supply that arises over that time period, yes?

PROFESSOR NEVEN: Hmm-hmm.

MR HARVEY: So what that means is, for trucks where the average -- sorry, where --

PROFESSOR NEVEN: I got it. But I am not really worried about this because of the concentration of the data that I have.

I mean, that responds to -- I mean, the main feature of the data, as we have discussed already, is that I have local estimation because I have, you know, trucks that are mostly, for the most part, not always, as I said, but for the most part, they are sold, you know, after five/six years in the case of Royal Mail.

So, you know, I am fine because this difference in number of days between the initial purchase and the resale does not vary so much more. I can see his point if indeed I was trying to extrapolate again too much and trying to extrapolate the results to cases in which trucks were resold very early or very late, which again brings us to some extent to BT.

But I think that I can see the point and I can see that extrapolation is difficult, but given the feature of the data, I am not sure I am too worried about this; and again -- okay, fine, sorry, I do not want to repeat.

MR HARVEY: Can I try to explain?

So it is true that there is a high proportion of trucks for Royal Mail that are sold at this sort of average six-and-a-half/six-year window, but there was a change, as I think you mentioned at the start,

Mr Ridyard, in terms of the depreciation policy that they had. I think they extended it from around seven years to ten years, and so, within this data set, there is a collection of trucks that are older and they are segmented -- they saw them as two groups, I think: one group where it was under the seven-year depreciation policy and another group that is under the ten-year depreciation policy.

I think in some of your charts you show that change in price that occurs later in the period and I think that is what is causing it. So that is, if you like, the empirical reason for my discomfort.

THE CHAIRMAN: All right. We will take our ten-minute break now.

(11.50 am)

(A short break)

(12.04 pm)

MR RIDYARD: The next question we had maybe Mr Harvey could go first on, is this so-called time-invariant properties of the trucks. To what extent does the correlation between the prices of new and used trucks distort the results from Professor Neven's analysis because we have this time-invariant assumption in the analysis.

MR HARVEY: I think, as you have probably gathered from my reports, this is something I am quite concerned about.

The nature of the problem is relatively straightforward so -- as we spoke about earlier, in effect the econometric analysis correlates the price of used trucks with the price of new trucks to try and understand whether that demand and supply effect is happening in practice.

The issue arises which is, if it happens to be the case that small used trucks tend to be sold cheaply because they are small, and large used trucks tend to be sold more expensively because they are large, there is a risk that what the analysis picks out is correlation between prices, not because the underlying market forces at work are driving them to be correlated but rather because we have found a correlation that says things are more expensive when they are big, used and new, or small.

So that is the essential nature of the problem. So it is important when you are doing these analyses to control for things like the characteristics of the products in question.

MR RIDYARD: But why do you think Professor Neven has not done that?

MR HARVEY: Why?

MR RIDYARD: Yes, in what way has he not done that?

MR HARVEY: The main regression Professor Neven relies on

does not include controls for the characteristics of the trucks, and so it is omitted from his analysis.

So in effect what happens is, when he calculates the average price of a new truck, that average price is the average price for a new truck that shares the same characteristics as the used truck and so that part of the analysis sort of says "I am going to pair up a large truck when it is new with a large truck when it is used". But in conducting the analysis of the relationship between the prices of the new and used trucks, so the point at which he says what is the strength of that correlation, he does not control for the characteristics of the used trucks.

So there is a risk that essentially what happens here is we see a correlation that is caused by the fact you have got similar trucks being compared with one another because they have the same characteristics, not because the underlying market forces are at work. So put another way, in an extreme scenario, let us suppose that all of these trucks were being sold for scrap, none of these market forces that we were talking about here were really at work, it may just be that a large truck has greater scrap value than a small truck because there is more steel in it, and this regression would pick out that correlation.

So that is the fundamental issue.

PROFESSOR NEVEN: Can I comment on that, because I think that Mr Harvey is really overstating the issue.

What I am picking up in that regression is a correlation between second-hand truck prices and new truck prices of trucks that are similar in the sense that they have similar characteristics. So in Mr Harvey's language, if there is a premium for big trucks, it is going to be reflected in the index. If there is a premium for more powerful trucks, it is going to be reflected in the index. So I am going to estimate this relationship between second-hand truck prices and new truck prices precisely controlling for these characteristics, precisely controlling for the fact that more powerful trucks, bigger trucks will have higher prices when they are sold new.

So to be specific, the fact that with a premium according to characteristics in new truck prices is controlled for. Where Mr Harvey may -- and it is not Mr Harvey raising the issue, it is also an issue that I was aware of -- I think where there is an issue is that the premium for characteristics in a used truck may be different from the premium for characteristics in a new truck. It may be less than proportionate or more than proportionate. That is the extent of the problem.

So it is not right to say that I am not controlling for the characteristics, I mean, the characteristics are in the new truck prices. The extent of the problem is that the premium in the second-hand market for characteristics may not be proportionate to the premium for the same characteristics in the new trucks.

That is why, you know, it is important as a sensitivity analysis to control for the characteristics and, you know, I am doing this, but in the sensitivity analysis I am introducing the characteristics, but of course you have to be, you know, careful in doing that because if you are introducing the characteristics in the regression and you are using the same characteristics in this auxiliary regression that is predicting the new truck prices, you have a problem of multicollinearity and eventually, I mean, you are destroying the identification. If you are removing all characteristics from the auxiliary regression, you are destroying the identification.

So I am not denying that, you know, there is a concern, but I think one should not overstate the concern. There is only a concern to the extent that the premia for characteristics are different, are not proportionate in the second-hand and in the new trucks market.

Now, when I do the sensitivity analysis, what I also find, but we can probably get to that later, is that actually not controlling for characteristics, I mean, tend to bias the estimates downwards. Indeed, not controlling for characteristics, not taking into account the fact that these premia in the second-hand market may not be proportionate to the premia in the new trucks market, not controlling for that, I mean might lead to a bias but you cannot identify the direction of this bias clearly because you have different characteristics. So you cannot say in which way the coefficient, the estimate of the relationship between second-hand truck prices and new truck prices will be affected. Is it going to be overestimated? Is it going to be underestimated? It really depends on the characteristics.

What I find empirically is that omitting them actually tends to introduce a bias downwards. So if I introduce them, I have higher estimates --

MR RIDYARD: Sorry, them being the other characteristics?

PROFESSOR NEVEN: Yes, that is right. If I introduce the characteristics in the main pricing equation.

So in a sense my approach from that perspective is conservative because I have a lower -- I am estimating a lower relationship, a less powerful relationship

between second-hand truck prices and new truck prices.

MR RIDYARD: So there seems to be a direct disagreement here.

Mr Harvey, does that response, what Professor Neven has said about what he has done to control for the type of truck, does that address your concern or not?

MR HARVEY: No, because it depends, unsurprisingly, on how you do that. I did several tests to see how robust the results were to controlling in different ways for characteristics, and I find that the results do not hold. I wonder whether it is probably helpful to go to one or two of the sensitivities and compare them, perhaps.

MR RIDYARD: Yes, let us do that.

MR HARVEY: So one of them is in my second report -- sorry, the reply report, which is at {E/IC31}. I will just find the page. It is on {E/31/50}, it is table 5. Can you see it?

MR RIDYARD: Yes.

MR HARVEY: So the second column of that table shows Professor Neven's main results. So the row that says gamma 1 plus alpha 2 is saying that a 1% increase in new truck prices at the time of truck's original purchase plus resale gives rise to a 1.15% increase in the price of a used truck. That is what that third row implies.

So that is sort of the one-for-one relationship that we have been speaking about.

The rows above that show how the figure has been derived, so the first figure, 0.851, is picking up, I think, the effect of, in a sense, the tightening of supply, although we will talk about that in a bit more detail in terms of the interpretation later, and the second effect is sort of picking up this contemporaneous increase in demand for used trucks as a consequence of the price of new trucks rising and the upward pressure that that gives rise to.

So they are the main results. Then what I did was to explore this issue by splitting the trucks into two groups, the CF trucks which you will recall are the larger trucks and the LF trucks which are the smaller ones, to see whether the sign and size of the estimated coefficients were similar in terms of magnitude and direction to the original results, and the table shows that they are not.

So in the case of the CF trucks, the estimated effect turns negative in the first row, which is sort of the opposite way round to what you would expect. The second row remains positive, but you can see that it rises by a factor of, you know, 6 or 7 or something like that. It is right to say that, obviously, the number of

observations in the CF group is that much smaller, which is shown in the last row of this table. So it is approximately two sevenths of the total sample size.

For LF trucks, the coefficient is double the main results in the first row and in the second row you get kind of the opposite outcome, which is you have a negative number, which is the opposite of what you would expect and it is statistically significant. Obviously, that row is estimated on a large number of observations. I think if the regressions were doing their job properly in terms of controlling for these characteristics, I would not expect to see the swings in sign and the order of magnitude changes that you observe here.

I think what is going on is that the main results, Professor Neven's results in this table, in a sense they are a weighted average of the results at CF and LF, and it just happens that they sort of come out on average looking sort of the right sign and perhaps of an order of magnitude that one might find acceptable, which we will talk about later.

So I had various other sensitivities which we can talk about, but this struck me as worrying.

MR RIDYARD: Professor Neven.

PROFESSOR NEVEN: Yes, I think that the results here should

be put in context, and I am not very surprised that if you were splitting the sample in two in this way that the model is not robust.

Essentially, in order to understand why, you need to look at the underlying pattern in the data, and if you do that, you will see that in particular with respect to CF trucks, we have lots of breaks in the data. So that it is not as if we have a sample that is continuous over time so that every year Royal Mail has purchased new trucks and then may have resold it in the future after a certain period of time.

I mean, there are many years in which simply there is no purchase of CF trucks, and we should not forget that the identification here is really relying on the time series. I mean, the identification is relying on differences between prices of trucks of a given type when they were initially purchased by Royal Mail and prices at which they were resold and what is identifying the relationship are these changes over time. So when you have breaks in the data the way you have it for CF trucks, I am not surprised that it is difficult. It is actually impossible to properly identify the relationship.

I mean, of course with respect to LF trucks, we have 5,000 trucks, it is more, but still one third of the

example. I mean, it is a significant amount and significant reduction in the amount of variation, so that, you know, this is an extreme test of the identification strategy that I am implementing and, you know, I am not surprised that if you do that, the result is not robust. I think that what -- you know, what is interesting, and we may sort of talk about this in a minute, is that if you do less extreme test of my identification strategy, then the results are robust, and indeed, if you introduce in the main pricing equation the characteristics, as we discussed earlier, the results are robust.

You know, this sort of idea of splitting the sample would only be of interest if there was an argument suggesting that the relationship between the second-hand truck prices and new truck prices were expected to be fundamentally different for CF and LF trucks. But I have not heard anything to that effect and I do not think that Mr Harvey has argued that, you know, this relationship between second-hand truck prices and new truck prices will be different --

MR RIDYARD: I do not think that is the point that is being made here though, is it? Mr Harvey's contention is that this is a way of illustrating the criticism he just made and saying he believed that the relationship ought to be

quite similar on each one of the two sub-samples, but it is not and that is what is causing him concern.

PROFESSOR NEVEN: No, it is not and I understand why. Simply the amount of variability of the data is not sufficient anymore, and in particular for CF trucks, so...

MR RIDYARD: Mr Harvey, do you consider that to be an adequate response to your concern?

MR HARVEY: No. The reason is, as I said, as I describe in these results, I can understand in relation to CF only that there is a material reduction in the sample size here. For the LF only, we still have five sevenths of the data set included. I do not think there has been any argument that that is insufficient variation to affect these, compromise these results.

MR RIDYARD: On the CF trucks, Professor Neven's point was not so much the small number of data points but just the fact that there was not a continuous observation over time.

MR HARVEY: No, it is true, there are breaks in the data, but I do not think that necessarily means or rationalises these results, because obviously, what matters is whether you have sufficient variation in order to understand the effects of interest.

So I do think there is a difference between the CF

trucks and the LF trucks in the dimension that Professor Neven has said. But I do not think it answers the sort of fundamental point that we have here, which is if you look at -- splitting these out, which is motivated by the concern that I raised, we have a group of trucks, LF trucks, where one of the coefficients is suggesting the opposite effect to what you would expect, and we have a doubling of the size of the order of magnitude. This really should not happen if the identification strategy is working properly.

I would also add that in relation to the magnitude of the coefficients, I think I am right in saying that the coefficient of 1.6 implies that the elasticity of demand for new trucks is 60% higher than the elasticity of demand for the used trucks of the type sold by the claimants.

We spoke earlier about elasticities. I do not have an elasticity of demand for used trucks of the type sold by the claimant, but I think intuitively you would expect it to be higher than the elasticity of demand for new trucks.

PROFESSOR NEVEN: Yes, just to -- a couple of responses to that.

I mean, of course what the results for LF only show is that, I mean, the variability in the data with

respect to CF somehow helps also the identification on the joint sample. That is to say that you need to have variation both with respect to CF and with respect to LF in order to properly identify the relationship of interest.

Again, you know, it is not all that surprising. I mean, there are some specific effects that you may have to control for if you are estimating this relationship on LF trucks only, but you cannot because you do not have the data, and that when you are estimating the model on CF and LF together, you do not need to control for these specific effects because, you know, the identification is helped by the variation in both dimensions.

So, again, I think that imposing that you should have -- I mean, that the identification should be robust to LF trucks only is really an extreme test, and so it does not sort of shake my confidence in the identification strategy that I am implementing. As I said, the tests of the identification strategy that I think are meaningful are more those in terms of changing the auxiliary regression and in terms of introducing characteristics.

MR RIDYARD: While we have this table up on the screen, I just wonder whether it might be a good time to jump

to -- we will come back to the intermediate questions, but jump to question (f) on our list, which is about the two different mechanisms that we talked about right upfront.

It might just help the tribunal if you could just explain what is in gamma 1 here and what is in alpha 2? What do those two things mean and do they relate to the two mechanisms that we talked about right up at the front of this discussion?

PROFESSOR NEVEN: Yes, there is an interpretation of these two parameters, gamma 1 and alpha 2, and that is something we alluded to earlier in the discussion today already.

The parameter gamma 1, as Mr Harvey has indicated, is the ratio of the elasticity of demand for new trucks over the elasticity of demand for used trucks of the type sold by, you know, Royal Mail, because all of that is contingent on the data that we have.

However, as we have discussed earlier, if you have additional supply effects, like the possibility that when new truck prices increase, I mean, there was an effect on the supply of used trucks, these will not be pure estimates. It is going to be a reduced form. So the interpretation in terms of the ratio of the elasticities is going to be affected by the possibility

that the supply of used trucks is affected by the increase in the price of new trucks.

That is with respect to the parameter gamma 1.

Then you have the parameter alpha 2. The parameter alpha 2, the second one that you see here on this table for instance, is capturing the degree of substitution between new trucks and second-hand trucks at the time of resale, okay? So it is capturing the substitution effect that we have been discussing earlier.

Again, it could be polluted by supply effects, but first approximation is that this is going to capture this degree of substitution. If you look at the structural interpretation of this, if you assume that there is no supply effect, then this parameter is going to be the ratio of the cross-price elasticity of the demand for used trucks with respect to the price of the new trucks divided by the elasticity of demand for used trucks.

MR RIDYARD: Okay, but what does that mean?

PROFESSOR NEVEN: Okay, let me now get back to the theory, so get back to the effect that you have here.

So in principle, alpha 2 is capturing the substitution effect, the fact that when new truck prices are going up, you would expect to have an effect on used truck prices such that used truck prices will also

go up.

MR RIDYARD: At the same --

PROFESSOR NEVEN: At the same time, exactly. That is the substitution effect. You see that here the type of estimates that I get, typically we can see it if we look at my own estimates in a minute, the type of estimate that I get is 0.3, 0.4, okay? Knowing that they could be marginally polluted by the supply effect, but that is the order of magnitude.

Now, let us then think about the interpretation of gamma. The interpretation of gamma 1 is essentially the intertemporal effect. It is the fact that if new truck prices were increased, possibly as a consequence of the infringement but more generally, I mean if new truck prices were increased, this leads to a reduction in the sales of new truck prices, hence a reduction in the supply of used trucks because fewer new trucks are being sold, that leads to fewer used trucks in the future.

However, this parameter gamma 1 is not sort of completely independent of the parameter alpha 2, and you can see that because of the ratio of elasticities. But without being technical about the ratio of elasticities, let us look about the intuition.

I mean, why is it not completely independent of alpha 2? Think about a situation in which there was no

substitution between new trucks and old trucks. What happens is you have a new truck and when it is resold as a used truck, it is resold in another country, okay? So there is no substitution at the time of resale.

I mean, you would still have a substitution effect. You will still have this intertemporal effect, okay? So the used truck prices would still be affected because there were fewer of them as a consequence of the fact that there were lower number of new trucks sold initially. So even if you had a completely segregated market, this intertemporal effect is going to be there.

Of course, if, on the top of this intertemporal effect, you have the substitution between new trucks and second-hand trucks, it is going to affect this parameter gamma 2. Why? Think about what happens in the time of the initial sales. If at the time of the initial sale, an increase in the price of new trucks leads to an increase in the price of used trucks because they are substitute, the effect of the increase in the price of new trucks on the sales of used trucks is going to be bigger. Why? Because as the new truck prices are increased, the buyers now find the second-hand trucks sold at that time as substitutes, so they are going to buy those, which means that the effect on the sale of new trucks is going to be bigger.

So what I am saying is that alpha 2 is capturing the substitution at the time of resale. Gamma 1 is capturing the intertemporal effect, but you cannot think about the intertemporal effect as being completely independent of the extent of substitution between new trucks and old trucks, because of the effect that I just described. If you have substitution between new trucks and old trucks at the time of the initial sale, you would expect the effect of the increase in the price of new trucks to be bigger on the sales of new trucks, because buyers have an alternative. They can go to the used truck market.

So the effect should be bigger, so gamma 1 is not identified as being capturing solely the intertemporal effect. It is a combination of the intertemporal effect that I described and of the degree of substitution between new and second-hand trucks.

MR RIDYARD: Mr Harvey, any comment on that?

MR HARVEY: No. I think that is right.

THE CHAIRMAN: I do not know whether it is related to that or not, but you are including in the analysis resale after the end of the infringement?

PROFESSOR NEVEN: Yes, okay.

THE CHAIRMAN: So the prices, we assume there was an overcharge as a result of the infringement on the new

truck sale.

PROFESSOR NEVEN: Okay.

THE CHAIRMAN: Will that have an effect then on the resale price outside of the period of the infringement?

PROFESSOR NEVEN: Okay. So we have to distinguish the econometric estimation that I am doing on the one hand and the way in which I compute the pass-on on the other, okay?

When it comes to the econometric estimation, I am using trucks that were sold new during -- actually before, even, before the period of the infringement, during the period of infringement and after, okay? I have second-hand truck prices for those. Those that were purchased before the beginning of the infringement were mostly sold during the period of the infringement, many of them were purchased new during the infringement and resold during the infringement, and then indeed some trucks were sold during the infringement and resold after the infringement.

I am using old trucks in my empirical estimation because my empirical estimation is agnostic with respect to the reason as to why new truck prices are higher. But, of course, the matter is different when I have to compute the counterfactual prices.

So if I have, say, a new truck that -- a truck that

has been sold new during the period of the infringement but resold after the period of the infringement, then there is only one of the two effects of the infringement that is at play. It is the intertemporal effect. Because it was sold new during the period of the infringement, higher prices, lower supply of used trucks in the future. But since it was resold after the end of the infringement, the prices come down. That is to say that if there has been an increase in price because of the infringement, at that point, you know, the price is the normal price.

So I should not, in the calculation of the counterfactual price, attribute any significance to that because the price has gone back to the normal level.

So in those particular circumstances that you are referring to, when I am computing the counterfactual price for second-hand trucks that have been sold after the end of the infringement but purchased during the period of the infringement, in computing the counterfactual price, I am only taking into account the intertemporal effect. I am only taking into account the fact that prices were higher during the infringement, and of course, I am not attributing any effect to potentially higher prices at the time of resale because, at the time of resale, prices were normal, they were

back to normal.

So for the estimation, I use everything because I am agnostic. But for the calculation of the degree of pass-on, I look at the specific circumstances of the initial purchase and the resale of each truck.

THE CHAIRMAN: So there cannot be any pass-on after the end of the infringement?

PROFESSOR NEVEN: There is only a pass-on to the extent that a truck was sold -- was initially purchased, sorry, new during the infringement, which then led to an effect because prices were higher during the infringement, lower sales of new trucks which has a follow-on effect, because, you know, if, say, in 2010 you have, because of the infringement, prices that are too high -- that are high, leading to lower sales of new trucks, this will have effects for a number of periods, okay, and this I am taking into account.

THE CHAIRMAN: Yes.

PROFESSOR NEVEN: But I am not assuming, after the end of the infringement, that current prices do affect the price of second-hand trucks because, I mean, after the end of the infringement the prices are back to the normal level.

MR RIDYARD: The new truck prices are.

PROFESSOR NEVEN: New truck prices, yes.

MR RIDYARD: But the used truck prices are still affected because they are more scarce than they would otherwise have been.

PROFESSOR NEVEN: That is right.

MR RIDYARD: That aspect, is that common between you? Are you both happy with that?

MR HARVEY: I think it is right to make the -- not add the demand side effect. The issue arises, I think, around whether the intertemporal effect is correctly estimated for that period, which I think we spoke about earlier because I was explaining this difference between -- the point about it being calculated on the average distance between purchase and resale. We have just spoken about the possibility that the intertemporal effect to some degree picks up the current effect through the estimation process.

So I think I am concerned that the combination of those things could lead to an overstatement of the extent of pass-on in the period after the infringement ended.

Then the second issue is that, intuitively, you might expect, after the infringement has ended, the supply effect would start to weaken. Because as trucks get older you will return to more like the competitive level of supply of used trucks. Of course there is not

a way within this analysis to take account of that, if you like, reducing effect of the -- over time supply returns to its previous level.

MR RIDYARD: Sorry, I do not understand that point, because in 2015, trucks are more scarce because the prices are elevated in 2010, and therefore fewer trucks were sold. So that problem would persist, would it not, in 2015?

MR HARVEY: It would, and I suppose what I am saying, in terms of over time what will happen is those trucks will go out of -- they will be scrapped and they will go out of the market, and over time what will happen is you will return back to the steady state where all the old trucks are sort of gone and dead and you are back in a new period where the stock of used trucks are back at the competitive level. I am not saying it is something that happens immediately, but over time you would expect that to happen.

MR RIDYARD: Right, okay.

PROFESSOR NEVEN: Can I just respond to these two points because I think the first point is incorrect.

When Mr Harvey said is that the estimate of gamma 1, which is the intertemporal effect, is, I mean, polluted by alpha 2, which is the substitution effect, I think that is incorrect to put it forward in those terms.

I think what I explain is that the degree of

substitution between new and second-hand trucks will affect the estimation of gamma 1, but in an economically meaningful way. It is because at the time of the initial sale of the truck there was a substitution between new trucks and second-hand trucks that the supply effect, the intertemporal effect, is stronger. So I do not think it leads to a bias or a problem of identification. It is just we have to accept that the intertemporal effect, as captured by gamma 2, is a reduced form.

With respect to the second point of Mr Harvey, I mean, again, we are back to the same discussion that we had earlier. The characteristics of our sample is such that there was a cliff, okay? After five/six years, older trucks are being resold -- most of the trucks are being resold in the Royal Mail data. So that is to say that, in our data, I mean, the trucks that are resold in 2011 are sort of all purchased during the infringement period in 12, 13, 14, 15. They are all purchased in the infringement period, and then in 2016, boom, it goes down.

But then, you know, at that point it does not affect my estimates anymore, because, I mean, these trucks are no longer purchased during the infringement period. So the characteristics -- even though he is right in terms

of principle, I think the characteristics of the sample are such that it is not really a concern.

MR RIDYARD: Right. Maybe we should jump back to a broader question really about, fundamentally, what is driving your results, Professor Neven, is this correlation between prices of new trucks and the prices of used trucks.

I mean, let me put it to you, Professor Neven, this question in the first instance, how confident are you that other kind of common factors that could -- I can think of all sorts of things that might create correlation between the prices of new and used trucks, and the question is how confident are you that your regressions have controlled for those other potential common factors? Because each one of them could lead to a spurious result in principle in your analysis?

PROFESSOR NEVEN: Now, if you have seen in my report, and maybe we should actually show that in the context of --

MR RIDYARD: Yes, let us do that.

PROFESSOR NEVEN: I think it is tab 2 here. I think it is table 3, but let me just get ... So it is at {E/13/21}, it is page 19 of the first report.

What you see in table 3 are my estimates of these two key parameters, gamma 1 and alpha 2. So gamma 1 is the intertemporal effect and alpha 2 is the

instantaneous substitution effect.

What matters for the computation of the degree of pass-on is the sum of these two coefficients, gamma 1 plus alpha 2, that you see in the third line. Now, what you also see in this table is that I am putting forward two sets of results: one that are OLS results and the second column which is two-stage least squares, 2SLS results. The difference between them captures or addresses the concern that was just expressed about common factors with respect -- common factors driving the prices of used trucks and the prices of new trucks.

So the issue that was raised is an issue which is referred to as a problem of endogeneity. So when you are regressing one variable on another, there may be a concern that indeed there are some common factors that will affect both variables and this will lead to a situation in which there is a correlation between the explanatory variable and the error term, and that is a problem of endogeneity, and endogeneity can lead to a bias.

Now, there are two sources of endogeneity in this estimation, one that relates to the correlation between or the relationship between used truck prices and new truck prices at the time of the initial purchase, okay? There the concern is that there may be some unobserved

demand factor that will affect the new truck prices. If you have an unobserved demand factor that increases, say, the demand for new trucks at the time, this will lead to more new trucks being sold at the time. This will lead to a higher supply of used trucks at the time of resale, hence a lower price. So if you fail to control for these factors, you will have a negative bias in your estimate.

If you look then at the other coefficient which is the relationship between used truck prices and the current new truck prices, you get the opposite, because there you may have a common factor that affects both prices because there is, you know, an increase in demand that you cannot really control for and this leads to a positive bias in the estimation. So I need to correct for that.

The standard way of dealing with this is to use instruments, so instead of using the new truck prices at the time of the initial purchase or the new truck prices at the time of resale, I use another variable and this other variable has the property that it is highly correlated with the prices but it is not correlated with the error term. So this is the usual technique in order to deal with these problems of endogeneity. Again, as is very common in this type of approach, I use cost as

a variable that is highly correlated with the price but not correlated with the error term, not correlated with the error term that would pick up these unobserved shift shocks in demand.

So this is why, in the context of these two-stage least squares results, what I do is that I first estimate for the new truck prices at the time of the initial purchase as well as the new truck prices at the time of resale what is referred to as a first-stage equation, in which I regress the prices on costs and other variables in order to obtain a variable that is called an instrument that has this property that it can solve the problem of endogeneity.

What is interesting is that, if you compare my estimate, you see that with respect to the second-stage least squares result, with respect to gamma 1, I have in the context of two-stage least squares an estimate of 0.851. In the context of OLS, which does not take into account this problem of endogeneity, I have a lower estimate which confirms that, if there is a problem, it is a problem of a negative -- of a bias which is negative, which will lower the effect if I do not control for the effect.

You see that in the second line, if I am comparing the estimates of second-stage least squares with the

estimate of the OLS, I get the opposite which confirms that failing to control for this problem of common factors that Mr Ridyard was referring to would lead, with respect to that coefficient, to an upward bias. So indeed the comparison between these two regression results confirmed that there may be a concern about endogeneity, there may be a concern about common factors, as suggested earlier, and that the second-stage least squares approach can actually correct for it.

MR RIDYARD: Mr Harvey.

MR HARVEY: So on this issue I thought that Professor Neven had controlled for the level of demand in the model directly as well, which could be a common factor which is taken account of, and the approach that is described in terms of two-stage least squares is quite standard, so I do not(?) have a major concern with those. My main concern is the common factor being the characteristic of the truck.

MR RIDYARD: Just on the instrument, using cost as the instrument, Professor Neven, if prices were -- if the common factor was the economy was overheating and demand was picking up, would it not also -- if you think about the costs that DAF incurs, I mean, a lot of those costs are prices of other people who are supplying tyres and then gearboxes or whatever else the components are, so

they would be affected by the economy overheating too, would they not? So it does not really -- does that compromise the quality of your instrument?

PROFESSOR NEVEN: Yes, I mean, you will see here that I am sort of using first stage estimates for both -- for two prices, okay? In doing that, in the two-stage least squares estimation, you would see that, as is completely standard econometric practice, I use as instrument both the cost that would be relevant for the price at the time of initial purchase and the cost at the time of resale. Of course by using both, which actually optimises the efficiency of the estimation, to some extent I address that issue.

MR RIDYARD: Okay.

Good, okay. I guess the last -- the only question outstanding I think is really the one about extending the Royal Mail results to BT. Professor Neven, maybe you should go first on this one. I can understand why you have not been able to do the estimation for BT specifically, but why should we believe that the Royal Mail results hold good for BT?

PROFESSOR NEVEN: Okay. I mean, as is clear from my report, the data for BT is very poor, okay? We only have 600 usable observations in terms of, you know, having prices at the time of resale, so having second-hand prices and,

unfortunately for BT, we do not have a variable that describes the condition of the truck. We actually have it only for about 30 or 40 which means that the data for BT is poor and it is impossible of course to estimate this model on so few data just for BT.

So the only thing that we can do is to try to see whether including the data for BT together -- pooling the data for BT with the data for Royal Mail, whether the results are significantly affected and this is one of the sensitivities that I have done. I find that the results are not affected, that the results are robust. Maybe, if you want to look at this table, it is I think table 22 in my initial report.

MR RIDYARD: Do you have a page number for that?

PROFESSOR NEVEN: Yes, it is 71 in my own pagination, 73 in that of the tribunal, so it is {E/IC13/73}. So you can see that the estimate of gamma 1 plus alpha 2, which are key for the estimation of the resale pass-on, are very similar to what we have before with respect to table 3. So this is what you get in the third grey line on this table. You see that the estimate, for instance if we focus on the right-hand side column which are the two-stage least squares estimates, you see that there again the point estimates are very similar to what I get if I use Royal Mail data only.

Having said this, I should not over-emphasise the significance of that result because I am only adding less than 600 trucks to 7,200. So, you know --

MR RIDYARD: So you would expect it to be dominated by the Royal Mail?

PROFESSOR NEVEN: Exactly. That is all I can say. I observed, like Mr Harvey, that BT trucks are sold older, I mean, typically around sort of ten/twelve years. It is possible that the relationship between second-hand truck prices and new truck prices is different for that sort of population of trucks but there is no way I can identify this with the data that I have, and the fact that the estimates are robust when I add BT should not be over-emphasised, given --

MR RIDYARD: But you are making a positive argument that the results do carry over or ...?

PROFESSOR NEVEN: I am making the argument that this is all I can say about BT, okay?

MR RIDYARD: That is not the same as saying you think we should rely on the RM results --

PROFESSOR NEVEN: I am saying that I really caveat this extension of the estimation to BT given the characteristics of the data and given the relative significance of the sample.

MR RIDYARD: Okay.

PROFESSOR NEVEN: So I am not sort of positively saying we should really use it for BT. I think this is indeed a source of concern.

MR RIDYARD: Mr Harvey, anything to add on that one?

MR HARVEY: I share Professor Neven's concerns that the trucks are clearly different in a way that could be expected to weaken the relationship between the prices. I think I am in broadly the same place.

MR RIDYARD: Yes, it was just really a question of what we do about that --

PROFESSOR NEVEN: As a tribunal.

MR RIDYARD: Good, okay. I think that covers the agenda. I do not know whether there are any other questions.

THE CHAIRMAN: I just want to ask a general question actually. There are a number of issues of mitigation of the overcharge that you both addressed and also other experts, complements, resale pass-on, supply pass-on. From an economic point of view, do you consider those in a particular order or do you just add them all up and say, "Actually, as it comes out, there is more than 100% recovery of the overcharge and Royal Mail and BT have actually made something out of it"? How do you approach all the issues or in what order do you approach them?

Mr Harvey.

MR HARVEY: Gosh, that is a difficult question.

THE CHAIRMAN: Maybe it is one for the lawyers rather than the experts but I thought, if you are considering economic issues, do you take into account, when you are considering resale pass-on, whether in fact the overcharge has been taken account of in some other way?

MR HARVEY: I think we do need to be -- they obviously need to be consistent with one another so in considering the supply pass-on, which I have done -- we will talk about tomorrow -- the way to approach the interaction between these two issues is to sort of think about, well, there is a chunk that relates to revenues that were made by selling the trucks. So you purchased an amount of trucks, 100, 10 of it was sold on at some point and that amount is sort of hived off, as it were, from the consideration of supply pass-on. I think that is the approach that both myself and Mr Bezant has taken, although we have hived off a different amount.

The question of the complementarity, it seems to me, sort of the bodies issue, is a bit more complicated because if there has been a reduction in price of the body, that could in principle, through these mechanisms, result in a reduction of the price of the body on resale. So I think, thinking about almost the ordering there, that would sort of tend to point towards thinking about complementarity and then thinking about resale

pass-on afterwards. But I caveat that with -- it feels like a question I would like to think more about.

PROFESSOR NEVEN: Yes, I think that it is indeed a difficult question.

THE CHAIRMAN: It is a very general question.

PROFESSOR NEVEN: I have not been involved in supply pass-on so I cannot say anything about the robustness of the methodology or about the evidence. I can comment on resale pass-on and on complements, which I have studied both --

THE CHAIRMAN: You had to consider supply pass-on for the loss of volume.

PROFESSOR NEVEN: Yes, but I basically took at face value --

THE CHAIRMAN: (Overspeaking - inaudible) -- Mr Bezant.

PROFESSOR NEVEN: Exactly -- what Mr Bezant said without looking into earlier events.

Of course the resale pass-on that we have here and the complements use very different methodologies. Here we are using actual data on the resale of BT trucks. In the case of complements we have -- in order to obtain an effect on the complements, we need to issue a lot of structure. We need to make a lot of assumptions about the type of competitive interactions and about the way in which the market functions.

I think that if it is possible to use data, in

principle I would have more confidence in results that use actual data when there is an appropriate methodology in order to exploit that data. So I think that I would give more credence probably to the resale pass-on which uses actual data from Royal Mail on the sales of -- resales of trucks, mapped to the original prices and given the robustness of the model that I have been -- that we have been in a position to implement.

So I would probably say that these estimates here -- I mean, it is difficult to do a ranking but, okay, if you push me to do a ranking, I think using data with an appropriate econometric methodology is probably better, if you can do it.

THE CHAIRMAN: All right. Well, conveniently at 1 o'clock we have finished the hot tub session.

MR BEARD: I had a couple of quick clarification questions from the hot tub, just on transcript issues. I can pick them up after lunch with the individuals concerned but I thought it might be easier just to cover them now.

THE CHAIRMAN: Right, okay. Why do you not.

MR BEARD: They really are clarificatory, I hope. The first was actually on [draft] page 23 in the transcript, Mr Harvey referred to using the Ivaldi price elasticity and sensitivities.

It is right, is it not, that you put that alongside

your own price elasticity and take a midpoint for the sensitivity?

MR HARVEY: That is correct.

MR BEARD: Yes.

The other one that was just a clarification in relation to the things that you said was, at [draft] page 18 in the transcript, you referred to a break occurring in the chain of substitution, but you were not saying that you had investigated where that break occurred in the chain of substitution?

MR HARVEY: No.

MR BEARD: No.

Then there was only one more which may well now have been covered. It actually went back, Mr Chairman, to a question you posed at [draft] page 34 in the transcript which was to do with whether or not Professor Neven's approach to the consideration of any putative overcharge, whether it was a putative 1% or 10%, was essentially presumed through.

Now, it may be that the subsequent questions on demand controls have effectively dealt with that but I did not know whether it was something that was worth going back to in relation to the question that you raised, whether or not there is essentially an assumption of a direct pass-through in relation to the

methodology that is used, but that is something that can be --

THE CHAIRMAN: Maybe I think you should pick that up in cross-examination if you want to.

MR BEARD: I will pick it up in re-examination if necessary. That is fine. I do not have anything else.

THE CHAIRMAN: Thank you very much. Mr Ward? No.

All right. So cross-examination then at 2.00.

Did you want to say something?

PROFESSOR NEVEN: Are we released?

THE CHAIRMAN: You are released over lunch so you can enjoy your lunch.

MR BEARD: I will review whether or not I actually have any questions for Mr Harvey over the course of the short adjournment because it may be, in the light of what has been covered this morning, I do not.

THE CHAIRMAN: Excellent. All right. 2 o'clock then.

(1.04 pm)

(The short adjournment)

(2.01 pm)

MR BEARD: Two matters. The first is that in relation to Mr Harvey and cross-examination, following on from the questioning and answers that were provided this morning and the matters of clarification I dealt with before the short adjournment, we do not have any questions for him.

THE CHAIRMAN: Okay.
MR BEARD: The tribunal made an enquiry over the short adjournment whether or not we might be able to start the questioning in relation to supply pass-on today.
THE CHAIRMAN: Yes.
MR BEARD: We are entirely content to do so, albeit we would need to get Mr Bezant down just so he can attend court. But we have made enquiries and he can be here by 3 o'clock, so that would be fine.

But I have spoken to Mr Ward and Mr Ward has indicated that Mr Harvey would prefer to start tomorrow. That is absolutely fine with us. We are not going to object. It was on the timetable. But that is the position in relation to our enquiry; we will start as and when.

THE CHAIRMAN: Right. I can understand that he should have a break and was expecting not to change subjects. I know it is quite difficult, must be quite difficult to do so. So --
MR BEARD: We are making no comment. I am just saying that is the position.
THE CHAIRMAN: Yes, I understand.

Did you want to say something, Mr Ward?

MR WARD: No, that is the position, exactly as you say, sir.
THE CHAIRMAN: Then we cannot really start, can we, with it?

Because he would go first.

MR BEARD: No, I might stand Mr Bezant down then because he is hurtling across town at the moment.

THE CHAIRMAN: All right. We will start early tomorrow anyway at 10 o'clock.

MR WARD: Thank you, sir.

THE CHAIRMAN: Do you want earlier? We can go on later tomorrow and Wednesday but not Thursday.

MR WARD: If I may say, that sounds very welcome. Mr Beard is going first anyway, so --

THE CHAIRMAN: With Mr Harvey, cross-examining.

MR WARD: So we will see what the time is when he has finished with Mr Harvey. I mean, as I said, I make no bones about the fact that I wish I had more time.

THE CHAIRMAN: I also think it is not particularly fair on the experts to be in the box for longer than three hours of a session. So we will start at 10.00 tomorrow.

MR WARD: Thank you, sir.

THE CHAIRMAN: Okay. So you do want to cross-examine Professor Neven?

MR WARD: Yes, but not for very long.

THE CHAIRMAN: Okay, great.

MR BEARD: Unless the tribunal wants me to take Professor Neven to any documents, we shall just deal with the swearing in and I will sit down.

PROFESSOR DAMIEN NEVEN (affirmed)

Cross-examination by MR WARD

THE CHAIRMAN: Yes.

MR WARD: Thank you, sir.

Good afternoon, Professor Neven. I want to talk to you about just two topics in fact, and the first one is the time-invariant characteristics, a topic that was touched on this morning.

Just to remind everybody, probably least of all you, what the issue is about. Mr Harvey made the point that it is a sort of general intuition. A truck with a more expensive kind of characteristic when new is likely to also be more expensive used. This is this point in the documents that talks about that a used Ferrari is going to cost more than a used Ford, say, and in the case of trucks one might say a new truck with high horsepower is likely to cost more than a new truck with low horsepower, but equally, a used truck with high horsepower will likely cost more than a used truck with low horsepower; yes?

A. But I corrected that intuition from Mr Harvey. I think the way Mr Harvey puts it is incorrect for the reasons I explained: is that in my estimation, in my approach, I take into account the fact that sort of trucks, say, with higher horsepower are going to be more expensive

new and that this premium will be reflected in the second-hand price.

Q. Yes.

A. The one issue which is not allowed for in my base specification is that the premium may not be proportionate. So that indeed the premium for a high horsepower in a second-hand truck may not be proportional to the premium for high horsepowers that you have in a new truck.

Q. What I would like to do is just look at the way you have done it and then see if we can agree what the problems are that this potentially gives rise to. The place to go, please, is {E/13/33}. This is your first report. This is your auxiliary regression.

A. Yes.

Q. So for the benefit of at least two members of the tribunal, the auxiliary regression is the regression that is carried out, as you can see, analysis for average price and cost of new trucks. So this is how Professor Neven calculated the cost of the new truck.

Indeed, if I may just go backwards, just again for more explanatory context, if we could go to page 25 {E/13/25}, a better place to start, (c) here, paragraph 4.11(c), this is where you explain, Professor Neven, what you are doing:

"Truck characteristics --"

Do you have it?

A. No. Oh, I have got it now.

Q. Thank you.

"Truck characteristics are only included in the estimation of the average price of new trucks, but not in the resale price equation."

So that is talking about the auxiliary regression is the average price of new trucks and the resale price equation is the main regression, is it not? Which we will come on and look at in a minute. Is that right, Professor Neven?

A. Yes.

Q. You explain that because of a potential problem:

"This is because the inclusion of truck characteristics that do not vary over time (eg, the horsepower of a truck) as explanatory variables in the resale price equation leads to a multi-collinearity problem as these characteristics were previously used to construct the explanatory variable for average new truck prices."

We are going to come on to that in just a second. Then you say:

"In order to test whether the results of my baseline regression model are driven by the exclusion of these

truck characteristics in the resale price equation, I have conducted a robustness test including extra control variables for truck characteristics ..."

We will look at that test in a moment. But first I just wanted to get clear, really for everyone's benefit, what is actually going on here.

If we look at table 6, where we were a second ago, on page 33 {E/13/33}, this is the auxiliary regression where you produce these essentially average prices for trucks of a particular type from the DAF sales; yes?

A. That is right.

Q. We can see that here you do control for five types of truck characteristic.

A. That is right.

Q. We have got LF, XF, in other words series; then the second one is number of axles; the third one is cabin type; the fourth one is horsepower; and the fifth one is whether tractor or trailer.

A. That is right.

Q. In your main model, your main result, if we turn to page 21, please {E/13/21} -- we can probably scroll down a little bit more, please -- this is the main model and in fact you do not control for any of those truck characteristics in the main model; correct?

A. That is correct, yes.

Q. The reason, I think, summarising what you said in the passage we just looked at, is because there is a risk of multicollinearity if you include those explanatory variables in the main model; would you agree?
A. I am concerned about that, yes.
Q. You are concerned about that. The opposite risk arises because if you do not control for them, you run a risk of bias, do you not, that you have omitted variables in the main model that could serve to explain the results? Would you agree?
A. Yes, that is what I have explained, is that there is a concern that if I do not include them, potentially there may be a bias. I do not know the direction of the bias, but this is why I do sensitivity.
Q. You appreciate that Mr Harvey's case is that this is in a sense in irreconcilable conflict within your model?
A. I do not think he has a credible case. I mean, I think the way he actually tests my model is unreasonable.
Q. Yes, well, we talked about that this morning. All I was going to do now is just look at the way you tested for it, and that takes us to, please, table 17 in your report, which is page 65 {E/13/65}. This, you alluded to this morning, I think, but it was not actually shown to the tribunal. Tell me when you have that. Do you have that, Professor Neven?

A. Yes.
Q. Great. What we can see here is that this is entitled:
"Estimated coefficients from the main regression model using [Royal Mail] resold truck data, including additional truck characteristics."
If we scroll down a little bit further, please, we can see "LF", so truck series, then horsepower, then number of axles, then cabin type and then tractor truck.
So what you have done here is put in the five time-invariant characteristics that were present in the auxiliary regression, in the initial auxiliary regression?
A. I think it is not the only thing that I have done.
Q. No. We will keep going, but if you do not mind we can take it in stages --
A. Okay.
Q. -- that would be helpful. So that in principle might address any problem of bias, might it not, as these characteristics are now present?
A. But it introduces a problem of multicollinearity potentially.
Q. Exactly. That is exactly it.
If we look, please, at the previous page, which is table 16 {E/13/64}, this is the auxiliary regression that you used for the purpose of table 17?

A. That is correct.

Q. Where you have amended the number of time-invariant characteristics.

So if I can just, really just for the benefit of the tribunal, we can see what we have. We now have three time-invariant characteristics instead of five. So we have LF, XF, we have horsepower and we have tractor truck, tractor or trailer?

A. And interacted.

Q. Yes. So we have taken out two of the five --

A. Correct.

Q. -- from the original auxiliary analysis and we have put all five into the main regression.

Now what I would like to do is look a bit more closely at the results that you achieved in table 17. What we see is a major departure from the initial results, because we can see, if we look at the gamma 1 2SLS coefficient, that is now 1.678 whereas previously in your main model it was 0.851. So it has more or less doubled. The alpha 2 coefficient has changed a bit, it has gone up a bit, but it is not dramatic. But the consequence of this is that the combined coefficient has gone from 1.153 to 2.016.

Now, what you said about this this morning is that this showed that your model was conservative. But is

not the reality here that what has happened is you have introduced a risk of multicollinearity and as a result the results have been skewed dramatically? This is really just a new problem rather than solving any problem.

A. No, but what you need to do is to compare the coefficient in the table 15 and table 17. So table 15 is the pricing equation which does not include the characteristics but with the new auxiliary regression. So the auxiliary regression that does not have the two characteristics that I have excluded, the number of axles and the cabin type.

You see essentially that indeed what is happening is that the coefficient gamma 1 is increasing when you are adding these characteristics, but what is interesting is to see that it is going up. So it is indeed a conservative estimate, because if I were to use this estimate in order to compute the pass-on in the case of Royal Mail, the pass-on would be much larger.

Q. You say it is conservative, but just simply because -- dealing with table 17, the coefficients have gone up but you have introduced a problem of multicollinearity into table 17.

A. Well, I am not denying the fact that there is a trade-off. I mean, there is a trade-off between

introducing characteristics in the pricing equation on the one hand and the type of precision that I can have in the auxiliary regression. So I am not denying that there was a trade-off and what this table is doing is to actually exploit the -- sorry, to explore, not exploit, to explore the terms of that trade-off.

Q. Professor Neven, I have put my case. Saying that you are exploiting the benefits of the trade-off, which I think is what you are saying --

A. Exploring.

Q. Exploring, sorry. In that case I misheard you.

But I put the case simply and I will put it one more time and then we will move on. You have got higher coefficients, but you have got them in a context where multicollinearity has arisen.

A. Well, I am exploring the extent to which this multicollinearity is an issue. That is it, and the fact that I see I can still estimate the two coefficients, gamma 1 and alpha 2, provide me with some reassurance, and the fact that it is conservative, that by introducing the characteristics and by potentially having more of an issue with multicollinearity, I have results that are leading to a higher pass-on, provides me with comfort with respect to my analysis, yes.

THE CHAIRMAN: Sorry to be slow but can you just explain to

me what you mean by "multicollinearity"?

A. Multicollinearity is an issue that arises when you have a high correlation between two explanatory variables. Actually, what is happening in this regression in table 17 is that I have a correlation between the characteristics on the one hand. You see them -- if you can go to table 17, it is there. I have the characteristics like horsepower, number of axles, cabin types, and some of these characteristics, in particular horsepower and family and tractor truck, have also been used in the auxiliary regression.

You see that the predicted price from the auxiliary regression are also used in the regression in table 17. So you see that the first two lines that you have in table 17 are the average price of new trucks at the time of the truck's original purchase and the average price of new trucks at the time of truck's resale.

These prices are coming from my auxiliary regression, but in my auxiliary regression I obtain these predicted prices using the characteristics that are also used in table 17. In particular, the characteristics that are common are the families, the horsepower and the dummy for tractor versus rigid.

So I am using the same variable twice in the regression, if you want. I am using it once in the

prediction of the prices, in the auxiliary regression, and I am using them a second time as a stand-alone variable. I know that this can potentially be an issue, so I want to check whether doing this actually prevents me from identifying the effect of the prices, and I do see, of course as expected, that there is a change but that this change is not dramatic, and I do also see that this change leads to a higher effect. I mean, it would lead to a higher pass-on. So that my approach of not using the characteristics is actually a conservative approach.

MR WARD: Sir, I wonder if I can help slightly here by just going back to -- just to show you what Mr Harvey says about what bias and multicollinearity mean in this context. I am sorry, I probably should have put more building blocks in before starting this line of questioning.

Could we go to {E/31/21}? Of course, Professor Neven, you can tell me if you disagree with how Mr Harvey has described this. If we could just go down a little bit further, please, Mr Harvey is explaining why he thinks the model is deficient, and he explains at 3.35 what the bias and multicollinearity problems are:

"Bias can arise for a number of reasons in

regression analysis. One reason it can arise is that one or more relevant explanatory variables are omitted from the regression model. By omitting these relevant variables, their effect can be wrongly attributed to other variables in the model, which biases the estimated coefficients ..."

I hope we agree on that as just a high level of generality?

A. [No verbal response]

Q. I have already put to you that that is the problem with the main regression, that it does omit those characteristics because it has no truck invariant characteristics in it?

A. I am not saying that -- you cannot tell whether there is a bias or not until you have done the estimation, and the fact that my estimation are robust shows that there is no bias.

Q. That is the point we are not really going to agree on I think, Professor Neven.

Then:

"multicollinearity occurs when two or more of the explanatory variables in a regression are highly correlated with each other."

In other words if you have the same variables, in this case, in both the new price and the used truck

regressions. Mr Harvey says:

"multicollinearity is a problem because the model may not be able to properly disentangle the effects of the different variables, and the effect of one variable can be wrongly attributed to the other variable."

A. Yes.

Q. You agree with that in principle?

A. I agree with the definition of multicollinearity, but you have to look at what is the symptom of it. What is happening is that when you have multicollinearity is that small changes in the sample will dramatically change the coefficient, and I do not see this. So I see that the coefficient changes, but it changes in a way that is reasonable.

Q. Well, it doubled, did it not? That is what we saw.

A. Yes, but, I mean, okay, you have to look at --

Q. You call that a small change?

A. Yes. But look at what I estimate, which is the sum of the two. The sum of the two is not affected to the same extent.

Q. Of course it was affected by the fact that gamma --

A. Gamma plus alpha -- alpha 2. Yes, it is affected of course, but it is also doubling actually. It is a bit less than doubling.

Q. I do not want to go round in circles because I have

backed up a little bit and I should have started there.

THE CHAIRMAN: No, that is fine.

MR WARD: I hope it is clear enough.

I will move on now to a completely different topic, if I may, which is some changes you made to your model in the third report, which is at {E/67/24}. These are in an annex. The first point dealt with a change to the demand metric in your report, if you recall.

A. Yes.

Q. In your main regression, you use DAF's order board as a demand control?

A. That is correct.

Q. Yes, and here you observe that there had been a mistake.

A. That is correct.

Q. It says at A.2, please, just go down:

"The order board measures the number of orders for DAF trucks that are waiting to go into production on a certain date."

At A.3:

"The order board dataset is sourced separately from three different time periods ..."

You explain those and then you say:

"The incorrect calculation occurred because, for the years 1996-2002, the order board corresponded to the Europe-wide level instead of the UK only. The order

board in the other time periods correctly corresponded to the UK only. As set out in the graphs below, this led to a higher order board for both CF and LF trucks from 1996 through 2002 ..."

If we turn to the next page, we can see the EU order board is in blue and the UK one is in red, and there is a big spike there that was only present, or rather was much more exaggerated, if you like, in the EU order board. Yes?

So what you then did was update your regression to reflect this error. We see that on page 26 {E/67/26}. The most important -- and we can see you have the first two columns which is your first report, as it were, main model, and then the second two columns are with the correction. There is quite a bit of movement, but the thing that is most striking here, obviously, is when we look at the alpha 2 coefficient, just looking at the 2SLS results -- sorry, Professor Neven, are you with me?

A. No.

Q. You are leafing. It is page 26 of the same report.

A. Okay, yes, I have got it.

Q. Super. So we can see the first two columns were results in the first report and the alpha 2 coefficient was 0.302 with three stars, which means highly statistically significant. Then the results for the correction, the

coefficient had fallen to 0.118, but, most importantly, it only had one star, so it had lost a great deal of its statistical significance.

Now, what happened next was that, instead of accepting that result, what you did was introduce another control variable in the form of currency. That is right, is it not?

A. Yes.

Q. We can see that on the next page {E/67/27}. It is a sort of last minute change to the model really where you say at A.9:

"I have investigated whether modifications to my empirical analysis -- in particular, the inclusion of alternative explanatory variables -- would result in an increased level of statistical significance for that coefficient."

Then you plumped upon exchange rate in order to achieve that.

Just before we talk about the principle, we just note the detail of how you did it. You say at the bottom of the page at A.12:

"I have calculated the ... exchange rate as a monthly average of the weekly average exchange rate. I then take the one-year lag ..."

That is not the budget rate, as you say. In fact it

is a different rate, is it not, to the budget rate? You will have seen Mr Harvey says in the joint experts' statement that this result that you get here is highly dependent on which exchange rate you use. Do you accept that?

A. Yes. Can I just stop you there? I think that, in preparing for this hearing, I reviewed these results again and I think that the introduction of the exchange rate is probably not such a great idea, and I think that -- I mean, not for the reasons mentioned by Mr Harvey because I think that the -- I mean, you have to think about the role that the exchange rate plays in the auxiliary regression here, knowing that we actually have sort of year and quarter dummies.

So all what the exchange rate would do, given that we have year and quarter dummies, is to pick up the effect of the exchange rate within quarters and, honestly, I am not sure that this is such a sensible way of approaching it.

So if I had to define what is my preferred specification on the basis of the third report, I think it would be the table that you referred to earlier. So it is table 1 in which indeed we see that the coefficient is only statistically significant at the 10% level. But I am not particularly worried about the fact

that it is only statistically -- only significant at the 10% level. I think that, you know, this reflects the nature of the exercise and, you know, statistical significance at 10%, you know, it is statistical significance at 10%.

It is also interesting to go back to alternative estimates that we could do which, instead of using the order board, would use tonne-kilometres. If you do that, you get a coefficient that is the same order of magnitude and has a higher level of significance.

Q. We do not have any of that working in your report, do we? You are now talking about something --

A. No, no, it is in report 1.

Q. The tonne-km?

A. Yes. Tonne-kilometre is in report 1.

Q. There is a sensitivity which combines a series of things --

A. That is right. It --

Q. But it is based upon the same error in report --

A. No, no, no, because the order is in order board. So --

Q. I am so sorry?

A. The order was in order board. So, but you are correct to say that in the first report you do not have the estimates with tonne-kilometre alone, you always have it tonne-kilometre together with order board and order

board is incorrect. So what you have in table 1 --

Q. Basically the same error. It takes us nowhere?

A. Well, that is right. The results with tonne-kilometre only, which I think are reliable results, are not in the first report. That is correct.

Q. Anyway, what you are now telling us in effect is that the exchange rate fix that you applied is not something you are standing by?

A. No, I am not comfortable with this. I mean, in any event, again, if you look at the consequences, the consequences in terms of the overall pass-on is minimum, and if you would calculate the pass-on on the basis of the results that I have in table 1, you actually end up with a higher pass-on.

So, I mean, the results that I have with the exchange rate, which on balance I am not so happy with, upon reflection is again a result that is conservative.

MR WARD: I have no more questions.

THE CHAIRMAN: Thank you.

You say you changed your mind on that last point?

A. Yes, I changed my mind on the exchange rate because, you know, what happens is that when you have the auxiliary regression, in principle -- the purpose of an auxiliary regression is to have a good fit. So you can introduce, I mean, variables which do not necessarily have a strong

economic justification because the objective is to have a good fit, and introducing the exchange rate was one way of doing it, but upon reflection, when I realised the role that the exchange rate plays, given that I have these dummies, I mean the sort of year and the quarter dummies, I do not think that it makes a lot of sense.

So I would rather use the results of table 1 in order to compute the pass-on and the result of table 1 actually leads to a higher pass-on for Royal Mail and BT. So what I have presented in my report is conservative.

THE CHAIRMAN: Was there anything else that you -- because you obviously were preparing for today and you went through and you came across this matter that you wanted to change. Was there anything else from your reports on this subject?

A. No. It is just this sensitivity with respect to the exchange rate that I would not want to, you know, see as the sort of default case for my estimation.

THE CHAIRMAN: Okay.

Any re-examination?

Re-examination by MR BEARD

MR BEARD: It is only probably clarificatory. There was a reference to tonne-kilometre. Mr Ward said it had not been dealt with, then I think accepted it had been dealt

with in conjunction with other matters.

I just want to check which table Professor Neven was referring to.

A. Okay. That is 2 --

Q. I think I know, but I am happy to let Professor Neven find it.

A. It is table 18.

MR BEARD: Okay, so I think that is {E/13/67}.

MR WARD: If I may, just for further clarification --

A. Actually, can I just interrupt you for a second? You see that there is a regression there which does -- no, sorry. I do not want to add anything.

Further cross-examination by MR WARD

MR WARD: I think you were going to the same point I was going to make, which we exchanged rather briefly but now Mr Beard has got this table in front of you. Allow me to just explain what I think this means, and Professor Neven can correct me immediately if I get this wrong. But we have different demand controls: tonne-kilometres, delivery and tonne-kilometres plus delivery. But the point was that all of these involve the order board --

A. That is right.

Q. -- which is what we were just discussing at the coefficient with the reduced statistical significance,

and you have agreed with me so ...

A. Sorry? I have not agreed to the last bit.

Q. Sorry, that they all involve the order board --

A. Yes, which is incorrect in that regression because of the way in which the variable is computed.

Q. You are saying it is corrected here even though it is --

A. No, no, it is not corrected here.

Q. I think we are agreeing with each other, but just not hearing each other very well.

A. Okay. No, it is not correct in there, but as I said, I have also checked what happens if you only introduced tonne-kilometre or only introduced delivery lag, and these results are not presented.

Q. But you have not shared those results with us?

A. No, because it is something I have done recently. I mean, if you do that, the results are essentially confirmed.

Q. We cannot really ask you about that because it is not in front --

A. If the tribunal wants them, I am happy to share them with the tribunal.

MR WARD: It is a little late for that, but thank you. Sir, thank you.

THE CHAIRMAN: Is there any other re-examination?

Further re-examination by MR BEARD

MR BEARD: It is only an explanatory question, but as long as the tribunal is familiar with the concept of 5% statistical significance and 10% statistical significance, otherwise I was going to ask Professor Neven just to explain the differences between the two, given that Mr Ward is placing apparent weight on these matters.

So it might be worth, if you would not mind, Professor Neven, just explaining that when you are referring to 10% statistical significance, what do you mean and what do the other levels of statistical significance mean, given that it all appears to turn on this?

A. Essentially, the interpretation of this level of statistical significance can be seen in terms of the possibility that the results could be due to chance.

So, essentially, when you were saying that the coefficient is different from zero with a level of statistical significance of 1%, it means that there is only 1% chance that this could be due to chance.

If we say that it is 5%, there was only 5% possibility that this is due to chance. If it is 10%, there is a 10% possibility that it is due to chance. That is it.

But so a level of significance of 10% is still

something that is highly significant in terms of the confidence that one can have with respect to the effects.

THE CHAIRMAN: But 1% is more significant --

A. 1% is better, of course.

MR BEARD: Nothing else. I just thought since that was being debated ...

THE CHAIRMAN: Right. Thank you very much, Professor Neven. I think that is you for the rest of the week and we will see you next week.

A. Thank you.

THE CHAIRMAN: Right, okay. So that is it?

MR BEARD: Yes.

THE CHAIRMAN: Is there any update on the timetabling for next week?

MR BEARD: Not immediately, but I think that we have discussed it over the short adjournment and I think contact is being made between different sides as to how best we might be able to deal with those issues. So it may be possible either to revert later this afternoon or first thing tomorrow morning on those. But it was picked up at the short adjournment, yes.

MR WARD: I think from our point of view we need to consider, in light of the indication that you do not want to hot tub loss of volume, how much time we need to

cross-examine, recognising entirely there is a proportionality question, about 600-odd pages and very small sums in the scheme of this case. But equally, we do bear a burden of putting our case on that point.

THE CHAIRMAN: All right.

MR WARD: So we will give it thought. We would like to save time. I was very grateful for the issue of complements being pushed back so that obviously has a squeezing effect on the timetable.

THE CHAIRMAN: Yes. We sort of think that we should probably stick with the hot tubbing for complements.

MR WARD: Good.

THE CHAIRMAN: Take some of the burden off you and, yes, you will let us know what we are going to do with loss of volume.

MR WARD: Okay, thank you very much.

THE CHAIRMAN: Okay, so we will see you at 10 o'clock tomorrow.

(2.37 pm)

(The hearing adjourned until Tuesday, 7 June 2022 at 10.00 am)

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